Preview of Award 1934568 - Annual Project Report

[Cover](#) |
[Accomplishments](#) |
[Products](#) |
[Participants/Organizations](#) |
[Impacts](#) |
[Changes/Problems](#)

Cover

Federal Agency and Organization Element to Which Report is Submitted:	4900
Federal Award or Other Identifying Number Assigned by Agency:	1934568
Project Title:	HDR TRIPODS: UC Davis TETRAPODS Institute of Data Science
PD/PI Name:	Naoki Saito, Principal Investigator Annamaria B Amenta, Co-Principal Investigator Chen-Nee Chuah, Co-Principal Investigator Thomas Chun Man Lee, Co-Principal Investigator
Recipient Organization:	University of California-Davis
Project/Grant Period:	10/01/2019 - 09/30/2024
Reporting Period:	10/01/2022 - 09/30/2023
Submitting Official (if other than PD\PI):	N/A
Submission Date:	N/A
Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)	N/A

Accomplishments

* What are the major goals of the project?

The UC Davis TETRAPODS Institute of Data Science (UCD4IDS)---composed of thirty-five researchers (four PIs and thirty-one senior personnel) coming from four departments (Computer Science, Electrical & Computer Engineering, Mathematics, and Statistics)---will break interdepartmental barriers and promote interdisciplinary research collaborations among faculty members, postdocs, and graduate students. Our project will encourage innovative and robust research, and provide education and mentoring of graduate students and postdocs in data science.

In particular, research at the UCD4IDS will focus on three broad themes: 1) Fundamentals of machine learning directed toward biological and medical applications; 2) Optimization theory and algorithms for machine learning including numerical solvers for large-scale nontrivial learning problems; and 3) High-dimensional data analysis on graphs and networks.

The technical goals of the above themes are: 1) geometric understanding of high-dimensional data, which may allow efficient (re)sampling from manifolds representing certain phenomena of interest and classifying subtle yet critical differences that often appear in biological and medical applications; 2) providing theoretical guarantees and efficient numerical algorithms for non-convex optimization, which is crucial to machine learning; and 3) deepening understanding of how local interactions between individual entities (e.g., neurons) lead to global coordination and decision making.

Students and postdocs engaged in this project will be trained to be the next generation of interdisciplinary data scientists: they will gain deep knowledge of some focused areas, and at the same time, broaden their perspectives in other diverse fields.

The UCD4IDS will bring in the insights gained by the experience of the faculty members in the four primary departments as well as application fields such as neuroscience, medical and health sciences, and veterinary medicine.

* What was accomplished under these goals and objectives (you must provide information for at least one of the 4 categories below)?

Major Activities: * Conducted research; prepared and published some of our results; presented and disseminated some of our results at conferences and seminars

* Co-organized the First Joint CeDAR/UCD4IDS Conference on December 2, 2022, which was quite a success. More than 40 people participated including about eight online participants. We learned about the latest research related to data science in our campus by six experts. Despite the UAW graduate student strike, quite a number of graduate students showed up! We also video recorded the talks, which are available online.

* Co-organized the 2023 ADVANCE Symposium together with Center for the Advancement of Multicultural Perspectives on Science (CAMPOS) on April 22, 2023, which highlighted and celebrated the contributions that the ADVANCE awardees have made to their fields and communities. The annual ADVANCE Scholar Award for UC Davis faculty acknowledges outstanding research, leadership and outreach to underserved communities, including through mentorship of under-represented students.

* Again, initiated quite a number of UC Davis internal collaborations

* Collaborated with three UC Davis groups that engage in data science research and education: Center for Data science and Artificial intelligence Research (CeDAR); the UC Davis DataLab; and the following two NSF-funded institutes: AI Institute for Next Generation Food Systems (AIFS); and HSI Strategic Innovation Summit for Advanced Research and Instruction in Artificial Intelligence and Quantum Information Sciences (HSI-SIS)

* Organized online seminar series related to data science throughout the academic quarters: the Mathematics of Data and Decision at Davis (MADDD) seminars; the Statistics seminars

* Organized annual Joint Mathematics/Statistics Colloquium

* Organized reading seminars on the subjects closely related to the project

* Maintained and constantly updated a website dedicated to our UCD4IDS

* Selected 21 graduate students among our four departments (CS: 1; ECE: 3; Math: 11; Stat: 6) and supported them partially as Graduate Student Researcher. Note that the funding allocations are not uniform among these 21 students; some only received partial summer support while the others received the maximum allowable amount for an academic quarter.

* More users have been added for the use of the GPU cluster in our UC Davis High Performance Computing (HPC) Core Facility. We were supposed to contribute our equipment funding to purchase a GPU system earlier, but due to some HPC administration problems, this did not happen until this summer (although we were able to use the existing GPU systems at HPC). Finally, our purchase order was processed, and will receive the new GPU system soon.

Specific Objectives:	1) Improve our geometric understanding of high-dimensional data, which may allow efficient (re)sampling from manifolds representing certain phenomena of interest and classifying subtle yet critical differences that often appear in biological and medical applications 2) Investigate and develop data harnessing, feature selection, statistical unsupervised learning, data sampling/streaming methodologies and algorithms 3) Provide theoretical guarantees and efficient numerical algorithms for non-convex optimization, which is crucial to machine learning 4) Investigate private, secure, and on-device machine learning 5) Investigate and develop tools for analyzing hypergraphs, tensors, and high-volume neural data, detecting anomalies/changes over networks, analyzing network structures via random matrix theory, and making cloud-based machine learning more efficient 6) Launch more internal collaborations within our four disciplines

7) Guide postdocs to become more independent data scientists who can contribute to our overall aims

8) Guide graduate students for data science research and education

Significant Results: The numbering corresponds to that of Specific Objectives section.

1) Hass(Math)/Koehl(CS) developed new algorithms to compute the Monge-Kantorovich and the Fromow-Wasserstein distances between two 3D shapes represented by triangulated meshes. These are based on statistical physics that removes the numerical instabilities associated with current algorithms, were applied for protein structure characterization.

Arsuaga(Math/MCB)/Vazquez(Math/MMG) worked on topological data analysis of cancer genomes: Analysis of the chromosome gains in 2q and 5p identified by their software TAaCGH in Luminal A patients has revealed three genes that are associated with patient survival, among others.

De Loera(Math) worked on: 1) Reinforcement Learning applied to the problem of solving integer programming problems; and 2) Application of topological data analysis in image segmentation of neurologically important cells that have a rather complicated morphology in 3D.

Polonik(Stat) developed a flexible notion of strong stability allowing for a unifying approach to normal approximation for stabilizing statistics based on Poisson and Binomial processes including various geometric/topological statistics: Euler characteristic, k-NN graph length, and Shannon entropy.

Devambu(CS) studied the ability of Large language models to synthesize code from input/output examples, and conducted a study of the calibration of models when generating code.

Jiang(Stat) studied HD asymptotic behavior of GWAS summary statistics and extended his previous classified mixed model prediction method to classified mixed model projection.

Rademacher(Math) made progress on a problem motivated by the analysis of combinatorial and geometric algorithms: the study of finite sets of Gaussian random points in R^d. His main results are asymptotic formulas for the number of facets and pairs of disjoint facets of the convex hull of Gaussian random point sets.

2) Ghiasi(ECE) developed signal analysis algorithms that improved SNR of sensed data under patient safety constraint, enable more accurate fetal heart tracking, and denoising of the raw sensed PPG waveforms, which were validated using in-vivo data obtained from large animal models and human subjects.

Fushing(Stat) developed algorithms for exploring and extracting information of relational and associative patterns between the time series response variables and covariate variables of many dimensions without man-made assumptions and structures.

Lopes(Stat) developed a new method to estimate errors of a widely-used randomized algorithm (Random Fourier Features), which can be applied broadly in the machine learning field because of its ability to handle very large datasets. He also developed a new bootstrap method for approximating the distributions of eigenvalue-based statistics associated with HD sample covariance matrices.

Rajaratnam(Stat) extended the Khinchin-Kahane inequality, a fundamental result in the probability literature, to arbitrary metric abelian groups; and also demonstrated how the

trajectory of local aerosols together with Green house gases will shape near-future precipitation patterns over South Asia using statistical methods.

3) Balasubramanian(Stat) proved results on Gaussian variational inference algorithms for non-log-concave targets; HD stochastic optimization; Gaussian approximations for deep neural networks; provable sampling from heavy-tailed densities; and particle methods for sampling.

Lai(ECE) studied the fairness-aware regression problems, and designed robust algorithms even in the presence of adversarial data contaminations. Significant fairness/accuracy improvement over existing methods is observed. He also characterized the tradeoff between the fairness and accuracy for robust regression problems, which will be useful for designing practical algorithms that have constraints on both fairness and accuracy metrics.

Fannjiang(Math) developed uniqueness theory for 3D phase retrieval with finite, discrete measurement data for strong/weak phase objects including: 1) Unique determination of phase projections from diffraction patterns; 2) Uniqueness for 3D phase unwrapping; and 3) Uniqueness for projection tomography. This approach has a practical implication of enabling classification and alignment when relative orientations are unknown.

Koeppe(Math) migrated the development infrastructure of the open source SageMath project from a self-hosted Trac server to the GitHub organization sagemath; 35000 tickets/issues/PRs, 1900 developer accounts, 1000 release tags were migrated.

4) Chuah(ECE) proposed a privacy-preserving synthetic data generation model that incorporates differential privacy through adaptive noise injection and randomize path selection via map-matching to generate synthetic mobility data that can provide privacy guarantees while retaining key human mobility patterns.

Zhi(ECE) developed a novel federated learning framework where the centralized server and clients (with heterogeneous data) jointly train a deep learning model. His partially-shared federated learning generative adversarial network model only requires clients to exchange the discriminators with the server but not the data generator, which ensures strong user data privacy and low bandwidth usage.

Strohmer(Math) developed a polynomial-time algorithm that creates a differentially private measure from a data set, which allows one to efficiently construct private synthetic data that are accurate for a wide range of statistical analysis tools.

5) Chaudhuri(Math/NPB) generalized his theory on common information encoding strategies in the brain that result in nonlinear low-dimensional structures in neural data to a broader family of information encoding strategies. He also developed adecorrelation theory of neural responses by neurons in a brain region (the entorhinal cortex), and confirmed predictions of this theory by experimental data.

Chen(Stat) generalized the causal inference framework with point-process treatments to the multivariate setting, which shows that the identification of causal estimands strongly depends on the type of instrumental variable. We proposed a novel method for additive shape invariant models that can be applied to a variety of neural data from controlled experiments with multiple stimuli.

T.Lee(Stat) developed an uncertainty quantification method for HD spectral line estimation and an automatic structure recognition algorithm for astronomical objects. In

the context of bandit problems, he proposed different frameworks for hyperparameter selection and generalized low-rank problems.

Le(Stat) studied network parametric bootstrap where the number of parameters grows linearly with the network size and showed that bootstrap samples from the estimated model generally suffer from bootstrap bias and proposed a second-level bootstrap procedure to correct it, which was used for constructing confidence intervals for network statistics.

Paul/T.Lee(Stat) continued to investigate Bayesian inference procedures for understanding the dependency in HD data that based on the correlatedness in terms of graph wavelets.

Saito(Math) developed methods to analyze signals recorded on edges and faces of simplicial complexes by multiscale basis dictionaries using Hodge Laplacians and the scattering transform using such dictionaries.

Results from our former postdocs who are still associated with UCD4IDS

Schonsheck(Math) published papers on: 1) a new nonlinear dimensionality reduction using the persistent cohomology of a dataset and solving a manifold-constrained optimization problem while preserving the homotopical information; 2) multiscale bases for simplicial complexes using Hodge Laplacians. He also submitted a paper on approximating nonlinear functions on unknown manifolds.

Shi(Stat) developed an L0 approximation using iteratively re-weighted L1, convergence of the method was established, and some simulation study was completed.

Key outcomes or Other achievements:	6) Launch more internal collaborations within our four disciplines:

During this period the following new collaborations within UC Davis have been initiated by the participants on this grant, which should be considered as key outcomes. Note that we are not listing those already listed in our last year's report.

+ Arsuaga/Vazquez(Math/MCB): with Shirley Ahn(Chem. Eng.) on predicting coronavirus host expansion events: a combination of machine learning, molecular modeling and experiments as well as 3D reconstruction and dynamics of the connector protein complex in bacteriophages.

+ Chaudhuri(Math/NPB): with Timothy Hanks (Neurology), Lin Tian (Biochemistry and Molecular Medicine), and Xiaomo Chen (Neurobiology, Physiology and Behavior) on studying neuromodulatory control of decision-making.

+ Chaudhuri(Math/NPB): with Xiaomo Chen (Neurobiology, Physiology and Behavior) on the timescales of cortical dynamics.

+ Chaudhuri(Math/NPB): with Ben Yoo (Electrical and Computer Engineering), Randall O'Reilly (Psychology/Computer Science), and Daniel Cox (Physics) on neuromorphic computing.

+ Hsieh(Stat): with 1) Emilio Ferrer (Psychology) on a longitudinal study of late adolescent's self-perception; 2) Bárbara Blanco-Ulate (Plant Science) on color evolution of pistachio.

+ Jiang/Paul(Stat) on a project related to genome-wide association study (GWAS)

+ Paul(Stat) with Nina Dörnemann (Stat) on spectral behavior of partial sum processes associated with sample covariance matrices.

+ Strohmer(Math): with Rachael Callcut and Jason Adams (both UC Davis Health) on the development of an algorithmic framework for the faithful and privacy-preserving generation of heterogeneous, dynamic synthetic datasets to boost the development of clinical decision support applications.

Also during this review period, some of the UCD4IDS members received the following noteworthy awards:

+ Four faculty members received the 2023 Graduate Program Advising and Mentoring Awards from the Office of Graduate Studies: Rishi Chaudhuri (Math/NPB); Jesus De Loera (Math); Prem Devanbu (CS); and Krishna Balasubramanian (Stat), for their excellence in mentoring our graduate students.

+ Our former faculty member, Xiaodong Li (Stat), received a 2023 UC Davis Chancellor's Fellowship, which provided $25K in unrestricted funds for his research or other scholarly work.

+ Prem Devanbu (CS) received two honors: one is the prestigious Alexander von Humboldt Research Award and the other is the 2022 ICSE Most Influential Paper Award (with his collaborators).

Finally, we conducted the external evaluation on our progress provided by the Institute for Social Research (ISR) at Sacramento State Univ. ISR is an interdisciplinary applied research center that has served as the external evaluator for numerous NSF-funded projects that support the STEM disciplines. In particular, ISR was an external evaluator for the NSF-sponsored project, "Interdisciplinary Training in Feminist Research for STEM Scholars" at UC Davis. The details can be found in the supporting file "UCD4IDS_Program Survey Summary_FINAL_03.29.23.pdf".

Here we show the Executive Summary of ISR's UCD4IDS Program Survey report:
The UC Davis TETRAPODS Institute of Data Science (UCD4IDS) is supported by the National Science Foundation (NSF) to unify data science research and education across four disciplines: Computer Science, Electrical & Computer Engineering, Mathematics, and Statistics. The primary goal of UCD4IDS is to identify and address cross-interdepartmental barriers and encourage interdisciplinary research collaborations among faculty members, postdocs, and graduate students. To this end, UCD4IDS organized various program activities including but not limited to, round-table discussions, quarterly colloquia, and annual workshops to foster an interdisciplinary data science community at UC Davis.
UCD4IDS partnered with the Institute for Social Research (ISR) to evaluate the impact of UCD4IDS program activities and gain a better understanding of ways the program could be improved in the future. Consequently, program surveys were created and distributed to both faculty[1] (N=39) and student[2] (N=49) participants between December 3, 2022 – January 6, 2023. However, due to low response rates, the deadline was extended to January 20, 2023. At the end of data collection, response rates for faculty members reached 79 percent and student response rates reached 78 percent.

Key Insights & Recommendations
Seminar & Colloquia | Overall, more than 90 percent of respondents rated the quality of seminars as good, very good, or excellent. Similarly, more than 80 percent of respondents rated the quality of colloquia positively[3]. However, a majority of respondents were not aware of seminar recordings and PowerPoint presentations available online. As a result, students recommended consolidating information regarding program activities in one place. In doing so, respondents may be more aware of resources and keep up-to-date with relevant program information.

Hardware & GPU | More than 70 percent of faculty and student respondents who have established an account on the GPU system found it useful. At the same time, faculty respondents reported several difficulties using this system. Faculty and student respondents emphasized the need for additional resources on how to use the GPU system.

Collaborations | More than 80 percent of faculty respondents felt enough opportunities were given to collaborate compared to student respondents (51%). Coordinating communication between collaborators emerged as the one major difficulty experienced by both faculty and students.

Software & Website Issues | Although a majority of respondents are aware of the GitHub website, fewer faculty and student respondents have utilized the website to download codes. Recommendations include clarity between various relevant websites and the need for a website coordinator.

Future of Data Science | While the majority of respondents were in favor of establishing a graduate group in data science, respondents also expressed concerns regarding various changes. Importantly, faculty and student respondents suggested ways to improve data science research, education, and activities which include increasing the number of professors and courses available, creating data science competitions to engage students, and providing more opportunities to build industry connections.

Footnotes:
1 Faculty includes the lead PI, co PI, faculty, postdocs, alumni faculty, and alumni postdocs.
2 Student includes graduate students and student alumni.
3 Positively represents respondents who indicated 'good', 'very good' or 'excellent'.

* What opportunities for training and professional development has the project provided?

7) Guide postdocs to become more independent data scientists who can contribute to our overall aims

* Our former postdoc, Stefan Schonsheck (Math), completed his postdoc position,
and became the Krener Assistant Professors (KAP) in the UC Davis math dept. with
100% appointment from July 2022 to June 2023. Subsequently, he successfully landed as a postdoctoral researcher at MILA/Univ. Montreal, Canada. Another former postdoc Xueheng Shi (Stat) who worked here from September 2021 to July 2022, successfully obtained a tenure-track assistant professor position at Univ. Nebraska-Lincoln, and started there in Fall 2022.

* In addition, Schonsheck worked as a reviewer for: 1) the ICLR workshop on Geometric Methods for Data Science (2023); 2) AIStat2023 where he was given a "top reviewer" award for his reviews.

* Finally, both Schonsheck and Shi gave their talks at our Joint CeDAR/UCD4IDS
conference where totally six people were invited for talks. Schonsheck gave 3 more conference talks while Shi gave one seminar as reported in the dissemination section.

8) Guide graduate students for data science research and education
* We have organized two regular weekly seminar series throughout the year, i.e.,
The Mathematics of Data and Decisions at Davis (MADDD) seminars and the Statistics Seminars. These seminars are targeted toward not only faculty experts but also graduate students interested in data science and machine learning. Many of these talks, especially, the MADDD seminar talks, were videotaped and placed on a public website for dissemination purposes.

* We also encouraged and supported our students to attend conferences and give their talks. It is our please to report that more than 10 talks were delivered by our students. See our Dissemination section for details.

* Many graduate students took online courses and tutorials on data science related subjects, in particular, via some YouTube channels and the online courses provided by Stanford University.

* UC Davis DataLab, with which we collaborate, provided several useful workshops on programming languages and software tools such as Python, R, Git. Our graduate students benefited by these.

* Have the results been disseminated to communities of interest? If so, please provide details.

Beyond our publications/other products listed in the Products section, we gave more than 118 seminars and talks during this review period.

Arsuaga(Math/MCB): MathFest, Sonoma State U., Apr. 2023
SAMSA-MASAMU CRN virtual colloq., U. Auburn, AL, Mar. 2023
Pandemic Engineering for Accessibility & Community Engagement, Davis, CA, Oct. 2022
CMC3 Conf. for California Community Colleges, Online, Apr. 2022

Aue(Stat): 24th Intern. Conf. on Computational Stat, U. Bologna, Italy, Online, Aug. 2022
NBER-NSF Time Series Mtg., Boston U., Online, Sep. 2022
Stat Sem., U. Hong Kong, Online, Nov. 2022
Advances in Time Series Conf., Le Mans U., France, Online, Nov. 2022
Keynote speaker, 16th German Probability & Stat Days, Essen, Germany, Mar. 2023
Workshop on Mathematical Stat in the Information Age, Freiburg, Germany, Mar. 2023
Stat Sem., Texas A&M U., College Station, TX, Apr. 2023
Workshop on Big Data in Economics & Finance, U. Cambridge, UK, May 2023
Workshop on Applications of Random Matrices in Economics & Stat, U. Oxford, UK, May 2023

Balasubramanian(Stat): 6th Intern. Conf. on Econometrics & Stat (EcoSta 2023), Tokyo, Japan, Aug. 2023
10th Intern. Congress on Industrial & Applied Math (ICIAM), Tokyo, Japan, Aug. 2023
Intern. Indian Stat. Association (IISA), Colorado, Jun. 2023
SIAM Conf. on Optimization, Seattle, May 2023
Bay Area Conf. on Optimization, Berkeley, May 2023
CMX Sem., Dept. Computational & Mathematical Sciences, Caltech, Apr. 2023
Industrial & Systems Engineering Sem., USC, Jan. 2023
Stat Sem., Columbia U., Jan. 2023
Information Systems Laboratory Colloq., Stanford U., Jan. 2023
Reunion workshop for the Geometric Methods in Optimization & Sampling program, Berkeley, Jan. 2023
IISA meeting, Bangalore, India, Dec. 2022
Chennai Mathematical Inst., Chennai, India, Dec. 2022
Indian Inst. of Technology - Madras, Chennai, India, Dec. 2022
Google research, Bangalore, Dec. 2022
Inst. of Mathematical Sciences, Chennai, India, Dec. 2022
Optimization in the Big Data Era, NUS Singapore, Dec. 2022
INFORMS Annual Mtg., Indianapolis, Oct. 2022
Stat Sem., UCLA, Oct. 2022
CS Sem., UCLA, Oct. 2022
Stat Sem., U. Michigan, Ann Arbor, Sep. 2022

Chaudhuri(Math/NPB): Transformations of the Human, UCB, Jan. 2023
Redwood Sem., UCB, Feb. 2023
Graduate Group in Applied Math Conf., UCD, Mar. 2023
Neurofest 2023, UCD, Mar. 2023
Computation & Theory Sem., HHMI Janelia Research Campus, Ashburn, VA, Apr. 2023

Chen(Stat): ICSA 2023 Applied Stat Symp., Ann Arbor, MI, June 2023
WNAR/IMS 2023 Annual Mtg., Anchorage, AK, June 2023
2023 Xiamen Symp. on Frontiers of Stat & Data Sci., Jul. 2023
EcoSta 2023, Tokyo, Japan, Aug. 2023
2023 Hangzhou Intern. Conf. on Frontiers of Data Sci., Aug. 2023

Chuah(ECE): CITRIS Workshop on K12-College STEM Education Partnership, Jul. 2023
CITRIS Advisory Board Mtg., Aug., 2023

De Loera(Math): Simons Center for Geometry & Physics "Workshop: Combinatorics & Geometry of Convex Polyhedra" Mar. 2023
Combinatorics Sem., U. Mass. Amherst, Feb. 2023
Applied Math Colloq. Speaker, Rice U., Apr. 2023
"Geller Lecture," Dept. of Math. Texas A&M U., Apr. 2023
Harvard-MIT combinatorics sem., May 2023
Plenary Speaker, SIAM Optimization Conf., Seattle, WA, May 2023

Devanbu(CS): Dagstuhl Sem. 23062 "Programming Language Processing," Feb. 2023
CS Sem., U. Stuttgart, Germany, Mar. 2023
Sem., SAP Labs, Heidelberg, Germany, Apr. 2023

Ding(ECE): Sem., Imperial College of London, London, UK, Mar. 2023
Sem., U. Minnesota, Minneapolis, MN, Mar. 2023

Fannjiang(Math): Applied Inverse Problems Intern. Conf., Göttingen, Germany, Sep. 2023
IPAM workshop on Diffractive Imaging with Phase Retrieval, Oct. 2022
Sem., National Chiao Tung U., Taiwan, Nov. 2022
Sem., National Central U., Taiwan, Nov. 2022

Jiang(Stat): Invited lecture series, Washington Stat. Society, Online, Dec. 2022
IISA Conf., Golden, CO, Jun. 2023
Academia Sinica, Taipei, Aug. 2023

Koeppe(Math): Sage Days 117 (hybrid), Feb. 2023
Sage Days 120 (hybrid), Jul. 2023

Lai(ECE): Annual Allerton Conf. on Communication, Control, & Computing, Montecello, IL, Sep. 2022

Le(Stat): EcoSta 2023, Tokyo, Japan, Aug. 2023
IISA, Golden, CO, Jun. 2023

T.Lee(Stat): Joint Stat. Mtgs, Washington, DC, Aug. 2022
CHASC/RISE-Astrostat Workshop, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, Aug. 2022
Another talk at CHASC/RISE-Astrostat Workshop, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, Aug. 2022
Eighth Bayesian, Fiducial & Frequentist Conf., Cincinnati, OH, May 2023

Lopes(Stat): EcoSta, Tokyo, Online, Aug. 2023
Stat Sem., UCSB, Mar. 2023
Dept. Math & Stat Sem., Auburn U., AL, Online, Feb. 2023
Computational Math Sem., Oak Ridge National Laboratory, Nov. 2022

Paul(Stat): Sem., Stat & Math Division, Indian Stat. Inst., Kolkata, Aug. 2023

Polonik(Stat): Workshop on "Nonlinear & High-dimensional Inference," Inst.
Henri Poincare, Paris, France, Oct. 2022
Sem., Orsay U., Paris, France, Nov. 2022
Conf. on "Geometry & Stat," Harvard U., Mar. 2023
Foundations of Computational Math (FoCM) Conf., Paris, Jun. 2023
Workshop in Lifting Inference of Kernel Embeddings, Bern, Switzerland, Jun. 2023

Rademacher(Math): ICERM, Brown U., Sep. 2022
Online sem. on Probability & Analysis, Mar. 2023
Online sem. on Geometry, Probability & Computing, Apr. 2023
CS Sem., UCSD, May 2023

Sem., Halıcıoğlu Data Sci. Inst., UCSD, May 2023
Talk, UCD COSMOS, Jul. 2023

Saito(Math): Sem., Math & Informatics Center Sem., U. Tokyo, Japan, Aug. 2022
JSIAM Annual Mtg., Hokkaido U., Japan, Sep. 2022
Intern. Conf. on Wavelet Analysis & Pattern Recognition, Toyama, Japan, Sep. 2022
Minisymp. on Geometry of Data: from Manifolds to Graphs, SIAM Conf. Math of Data Sci., San Diego, CA, Online, Sep. 2022
Poster presentation, NSF HDR PI Mtg., Alexandria, VA, Oct. 2022
Applied Math Sem., Yale U., Nov. 2022
Conf. on A Multiscale Tour of Harmonic Analysis & Machine Learning, IHES, France, Apr. 2023
Graph Signal Processing Workshop, Oxford, UK, Jun. 2023
Workshop on "Foundations of Numerical PDEs," FoCM 2023, Paris, France, Jun. 2023
SampTA 2023, Yale U., Jul. 2023
Minisymp. on "Recent Advances in Multiscale Transforms for Image Analysis," ICIAM 2023, Tokyo, Japan, Aug. 2023
Workshop on Linear Algebraic Graph Theory, Hiroshima U., Japan, Sep. 2023

Strohmer(Math): Sem., Northwestern U., Apr. 2023
Penn Math Colloq., UPenn, Apr. 2023
Symp. on Responsible Innovation at the Intersection of Privacy & AI, UCD, Mar. 2023
3rd ACM Intern. Conf. on AI in Finance, New York, Nov. 2022

Postdocs:

Schonsheck(Math): 1st Joint CeDAR/UCD4IDS Conf., UCD, Dec. 2022
Applied Math Days, RPI, 2023

Shi(Stat): 64th ISI World Stat. Congress, Ottawa, Canada, Jul. 2023

Graduate Students:
Almendra Hernandez(Math): Nonlinear Algebra & Stat Sem., Illinois Inst. of Technology, Apr. 2023
Special session on "Math in Data Sci." at the AMS Sectional Mtg., Cal State Fresno, May 2023

Bhattacharjee(Stat): IISA Conf., Golden, CO, June 2023

Chak(Math): ADVANCE Award Symp., UCD, Apr. 2023
AMS Special Session on Data Sci. at the Crossroads of Analysis, Geometry, & Topology, JMM, Boston, MA, Jan. 2023

Chan(CS): 4th Intern. Conf. on Precision Nutrition & Metabolism in Public Health & Medicine, Ioannina, Greece, Jun. 2023

Chen(Math): 2023 Intern. Conf. on Machine Learning, Honolulu, HI, poster, Jul. 2023
39th Conf. on Uncertainty in Artificial Intelligence, Pittsburgh, PA, poster, Aug. 2023

He(Math): Algorithms & Computationally Intensive Inference Sem., Warwick, UK, Online, May 2023

Joarder(ECE): ACM CHASE23, Orlando, FL, Jun. 2023

Knight(Math): 2023 ADVANCE Award Symp., UCD, poster, Apr. 2023
Workshop on Modern Applied & Computational Analysis, ICERM, Brown U., poster, Jun 2023

Weicht(Math): 2023 ADVANCE Award Symp., UCD, poster, Apr. 2023

Dissemination effort other than talks:
Saito(Math) has maintaining the UCD4IDS GitHub website, which currently lists 12 open-source software packages including his own packages.

Koeppe(Math) has been the lead developer of SageMath, an open source mathematical system that has become important in data science.

* What do you plan to do during the next reporting period to accomplish the goals?

We will plan to have more in-person seminars, meetings, and roundtable discussions in the forthcoming year to make further progress on every front of research, teaching, and training of our graduate students. In addition, we plan to organize a workshop in Winter 2024, which will be associated with an opening ceremony for our data science activity space (with offices, meeting rooms, a lot of open space for interactions, etc.) on the first floor and the basement of the Physical Science and Engineering Library (currently under renovation).

Supporting Files

Filename	Description	Uploaded By	Uploaded On
2023_ADVANCE_Symposium_Summary.pdf	Summary of the 2023 ADVANCE Symposium that we co-organized.	Naoki Saito	09/18/2023
UCD4IDS_Program Survey Summary_FINAL_03.29.23.pdf	UCD4IDS Program Survey conducted by the Institute for Social Research (ISR) at Sacramento State University	Naoki Saito	09/29/2023

Products

Books

Book Chapters

Inventions

Journals or Juried Conference Papers
View all journal publications currently available in the [NSF Public Access Repository](#) for this award.

The results in the NSF Public Access Repository will include a comprehensive listing of all journal publications recorded to date that are associated with this award.

Wang, Siyao and Lopes, Miles E.. (2023). A bootstrap method for spectral statistics in high-dimensional elliptical models. *Electronic Journal of Statistics*. 17 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Joarder, Rishad and Kasap, Begum and Ghiasi, Soheil. (2023). RT-TRAQ: An algorithm for real-time tracking of faint quasi-periodic signals in noisy time series. *Smart Health*. 28 (C) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/03/2023) Full text   Citation details

Chen, Xuxing and Huang, Minhui and Ma, Shiqian. (2023). Decentralized Bilevel Optimization with Improved per-Iteration Complexity. . 202 . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Vali, Kourosh and Vafi, Ata and Kasap, Begum and Ghiasi, Soheil. (2023). BASS: Safe Deep Tissue Optical Sensing for Wearable Embedded Systems. *ACM Transactions on Embedded Computing Systems*. 22 (5s) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Chak, Wai Ho and Saito, Naoki and Weber, David. (2022). The Scattering Transform Network with Generalized Morse Wavelets and its Application to Music Genre Classification. *Proceedings of 2022 International Conference on Wavelet Analysis and Pattern Recognition (ICWAPR)*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/01/2023) Full text   Citation details

Jesse, Kevin and Devanbu, Premkumar and Sawant, Anand Ashok. (2022). Learning To Predict User-Defined Types. *IEEE Transactions on Software Engineering*. Early Access . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Boedihardjo, March and Strohmer, Thomas and Vershynin, Roman. (2023). Privacy of Synthetic Data: A Statistical Framework. *IEEE Transactions on Information Theory*. 69 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Leroux, Brett and Rademacher, Luis. (2023). Improved Bounds for the Expected Number of k-Sets. *Discrete & Computational Geometry*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

De Loera, Jesús A. and Jaramillo-Rodriguez, Edgar and Oliveros, Deborah and Torres, Antonio J.. (2023). A Model for Birdwatching and other Chronological Sampling Activities. *The American Mathematical Monthly*. 130 (6) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Li, J. and Ma, S.. (2023). Federated learning on Riemannian manifolds. *Applied Set-Valued Analysis and Optimization*. 5 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Yao, Junwen and Lopes, Miles. (2024). Rates of Bootstrap Approximation for Eigenvalues in High-Dimensional PCA. *Statistica Sinica*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Haydari, Ammar and Chuah, Chen-Nee and Zhang, Michael and Macfarlane, Jane and Peisert, Sean. (2022). Differentially Private Map Matching for Mobility Trajectories. . . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Aue, Alexander and Dette, Holger and Rice, Greg. (2023). Two-Sample Tests for Relevant Differences in the Eigenfunctions of Covariance Operators. *Statistica Sinica*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/29/2023) Full text   Citation details

Rademacher, Luis and Shu, Chang. (2022). The smoothed complexity of Frank–Wolfe methods via conditioning of random matrices and polytopes. *Mathematical Statistics and Learning*. 5 (3) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Hildebrand, Robert and Köppe, Matthias and Zhou, Yuan. (2022). Equivariant Perturbation in Gomory and Johnson's Infinite Group Problem. VII. Inverse Semigroup Theory, Closures, Decomposition of Perturbations. *Open Journal of Mathematical Optimization*. 3 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

De Loera, Jesús A. and Kafer, Sean and Sanità, Laura. (2022). Pivot Rules for Circuit-Augmentation Algorithms in Linear Optimization. *SIAM Journal on Optimization*. 32 (3) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Yue, Xiang and Inan, Huseyin and Li, Xuechen and Kumar, Girish and McAnallen, Julia and Shajari, Hoda and Sun, Huan and Levitan, David and Sim, Robert. (2023). Synthetic Text Generation with Differential Privacy: A Simple and Practical Recipe. . . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Kasap, Begum and Vali, Kourosh and Qian, Weitai and Saffarpour, Mahya and Ghiasi, Soheil. (2023). KUBAI: Sensor Fusion for Non-Invasive Fetal Heart Rate Tracking. *IEEE Transactions on Biomedical Engineering*. 70 (7) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Xiao, Tesi and Chen, Xuxing and Balasubramanian, Krishnakumar and Ghadimi, Saeed. (2023). A one-sample decentralized proximal algorithm for non-convex stochastic composite optimization. . 216 . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Jiang, Jiming and Jiang, Wei and Paul, Debashis and Zhang, Yiliang and Zhao, Hongyu. (2024). High-Dimensional Asymptotic Behavior of Inference Based on Gwas Summary Statistics. *Statistica Sinica*. 33 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Aue, Alexander and Burman, Prabir. (2023). Estimation of prediction error in time series. *Biometrika*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Yang, Xi and Hsieh, Fushing. (2023). Mimicking Gait Dynamics: A Step Toward Precision Learning of Human Activities. *IEEE Access*. 11 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

McVey, Catherine and Hsieh, Fushing and Manriquez, Diego and Pinedo, Pablo and Horback, Kristina. (2023). Invited Review: Applications of unsupervised machine learning in livestock behavior: Case studies in recovering unanticipated behavioral patterns from precision livestock farming data streams. *Applied Animal Science*. 39 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Yao, Junwen and Erichson, N. Benjamin and Lopes, Miles E.. (2023). Error Estimation for Random Fourier Features. . 206 . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Khare, Apoorva and Rajaratnam, Bala. (2023). The Khinchin–Kahane and Lévy inequalities for abelian metric groups, and transfer from normed (abelian semi)groups to Banach spaces. *Journal of Mathematical Analysis and Applications*. 528 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Singh, Jitendra and Cook, Benjamin I. and Marvel, Kate and McDermid, Sonali and Persad, Geeta G. and Rajaratnam, Bala and Singh, Deepti. (2023). Anthropogenic Aerosols Delay the Emergence of GHGs-Forced Wetting of South Asian Rainy Seasons Under a Fossil-Fuel Intensive Pathway. *Geophysical Research Letters*. 50 (18) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/02/2023) Full text   Citation details

Fang, Ruijie and Zhang, Ruoyu and Hosseini, Elahe and Orooji, Mahdi and Homayoun, Houman and Hosseini, Sayed Mohammad and Faghih, Mahya and Rafatirad, Soheil and Rafatirad, Setareh. (2022). ATLAS: An Adaptive Transfer Learning Based Pain Assessment System: A Real Life Unsupervised Pain Assessment Solution. . . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/01/2023) Full text   Citation details

Chak, Wai Ho and Saito, Naoki. (2023). Monogenic wavelet scattering network for texture image classification. *JSIAM Letters*. 15 (0) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 10/01/2023) Full text   Citation details

Reagan, Krystle L. and Deng, Shaofeng and Sheng, Junda and Sebastian, Jamie and Wang, Zhe and Huebner, Sara N. and Wenke, Louise A. and Michalak, Sarah R. and Strohmer, Thomas and Sykes, Jane E.. (2022). Use of machine-learning algorithms to aid in the early detection of leptospirosis in dogs. *Journal of Veterinary Diagnostic Investigation*. 34 (4) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Lopes, Miles E.. (2022). Central limit theorem and bootstrap approximation in high dimensions: Near 1/n rates via implicit smoothing. *The Annals of Statistics*. 50 (5) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Jiao, Shuhao and Aue, Alexander and Ombao, Hernando. (2023). Functional Time Series Prediction Under Partial Observation of the Future Curve. *Journal of the American Statistical Association*. 118 (541) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Lopes, Miles E. and Erichson, N. Benjamin and Mahoney, Michael W.. (2023). Bootstrapping the operator norm in high dimensions: Error estimation for covariance matrices and sketching. *Bernoulli*. 29 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Boedihardjo, March and Strohmer, Thomas and Vershynin, Roman. (2022). Covariance's Loss is Privacy's Gain: Computationally Efficient, Private and Accurate Synthetic Data. *Foundations of Computational Mathematics*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Boedihardjo, March and Strohmer, Thomas and Vershynin, Roman. (2022). Private Sampling: A Noiseless Approach for Generating Differentially Private Synthetic Data. *SIAM Journal on Mathematics of Data Science*. 4 (3) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Wei, Yun and Rajaratnam, Bala and Heroiii, Alfred O.. (2023). A Unified Framework for Correlation Mining in Ultra-High Dimension. *IEEE Transactions on Information Theory*. 69 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/30/2023) Full text   Citation details

Fan, Minjie and Wang, Jue and Kashyap, Vinay L. and Lee, Thomas C. M. and van Dyk, David A. and Zezas, Andreas. (2023). Identifying Diffuse Spatial Structures in High-energy Photon Lists. *The Astronomical Journal*. 165 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 08/22/2023) Full text   Citation details

Matsuo, Tomoko and Fan, Minjie and Shi, Xueling and Miller, Caleb and Ruohoniemi, J. Michael and Paul, Debashis and Lee, Thomas C. M.. (2021). Multiresolution Modeling of High-Latitude Ionospheric Electric Field Variability and Impact on Joule Heating Using SuperDARN Data. *Journal of Geophysical Research: Space Physics*. 126 (9) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/18/2022) Full text   Citation details

Tang, Tongyi and Balasubramanian, Krishnakumar and Lee, Thomas C.. (2022). High-Probability Bounds for Robust Stochastic Frank-Wolfe Algorithm. *Proceedings of the 38th Conference on Uncertainty in Artificial Intelligence (UAI 2022)*. PMLR 180 1917-1927. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 08/22/2023) Full text   Citation details

Han, Yi and Lee, Thomas C.. (2022). Uncertainty Quantification for Sparse Estimation of Spectral Lines. *IEEE Transactions on Signal Processing*. 70 6243 to 6256. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 08/22/2023) Full text   Citation details

Ding, Qin and Kang, Yue and Liu, Yi-Wei and Lee, Thomas C. and Hsieh, Cho-Jui and Sharpnack, James. (2022). Syndicated Bandits: A Framework for Auto Tuning Hyper-parameters in Contextual Bandit Algorithms. *36th Conference on Neural Information Processing Systems (NeurIPS 2022)*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 08/22/2023) Full text   Citation details

Kang, Yue and Hsieh, Cho-Jui and Lee, Thomas C.. (2022). Efficient Frameworks for Generalized Low-Rank Matrix Bandit Problems. *36th Conference on Neural Information Processing Systems (NeurIPS 2022)*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 08/22/2023) Full text   Citation details

Su, Yi and Hannig, Jan and Lee, Thomas C.. (2022). Uncertainty Quantification in Graphon Estimation Using Generalized Fiducial Inference. *IEEE Transactions on Signal and Information Processing over Networks*. 8 597 to 609. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 07/31/2022) Full text   Citation details

Liao, Shuting and Macharoen, Kantharakorn and McDonald, Karen A. and Nandi, Somen and Paul, Debashis. (2022). Analysis of Variability of Functionals of Recombinant Protein Production Trajectories Based on Limited Data. *International Journal of Molecular Sciences*. 23 (14) 7628. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/18/2022) Full text   Citation details

Jiang, Jiming and Wand, Matt P. and Bhaskaran, Aishwarya. (2021). Usable and Precise Asymptotics for Generalized Linear Mixed Model Analysis and Design. *Journal of the Royal Statistical Society Series B: Statistical Methodology*. 84 (1) p. 55-82. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/18/2022) Full text   Citation details

Tagkopoulos, Ilias and Brown, Stephen F. and Liu, Xin and Zhao, Qing and Zohdi, Tarek I. and Mason Earles, J. and Nitin, Nitin and Runcie, Daniel E. and Lemay, Danielle G. and Smith, Aaron D. and Ronald, Pamela C. and Feng, Hao and David Youtsey, Gabriel. (2022). Special report: AI Institute for next generation food systems (AIFS). *Computers and Electronics in Agriculture*. 196 (C) 106819. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Koehl, Patrice and Orland, Henri. (2022). Sampling constrained stochastic trajectories using Brownian bridges. *The Journal of Chemical Physics*. 157 (5) 054105. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Saito, Naoki and Shao, Yiqun. (2022). eGHWT: The Extended Generalized Haar–Walsh Transform. *Journal of Mathematical Imaging and Vision*. 64 (3) p. 261-283. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/16/2022) Full text   Citation details

Hiltner, Lindsey and Carme Calderer, M. and Arsuaga, Javier and Vázquez, Mariel. (2021). Chromonic liquid crystals and packing configurations of bacteriophage viruses. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*. 379 (2201) 20200111. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 09/24/2022) Full text   Citation details

Liu, Pei and Arsuaga, Javier and Calderer, M. Carme and Golovaty, Dmitry and Vazquez, Mariel and Walker, Shawn. (2021). Ion-dependent DNA configuration in bacteriophage capsids. *Biophysical Journal*. 120 (16) 3292 to 3302. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 09/24/2022) Full text   Citation details

Aslam, Jai and Ardanza-Trevijano, Sergio and Xiong, Jingwei and Arsuaga, Javier and Sazdanovic, Radmila. (2022). TAaCGH Suite for Detecting Cancer—Specific Copy Number Changes Using Topological Signatures. *Entropy*. 24 (7) 896. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 09/24/2022) Full text Citation details

Deng, Qinwen and Zhang, Songyang and Ding, Zhi. (2021). Point Cloud Resampling via Hypergraph Signal Processing. *IEEE Signal Processing Letters*. 28 2117 to 2121. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Wang, Chao and Tao, Min and Chuah, Chen-Nee and Nagy, James and Lou, Yifei. (2022). Minimizing L 1 over L 2 norms on the gradient. *Inverse Problems*. 38 (6) 065011. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text Citation details

Qi, Siyu and Bai, Zhaojun and Ding, Zhi and Jayasundara, Nimal and He, Minxue and Sandhu, Prabhjot and Seneviratne, Sanjaya and Kadir, Tariq. (2021). Enhanced Artificial Neural Networks for Salinity Estimation and Forecasting in the Sacramento-San Joaquin Delta of California. *Journal of Water Resources Planning and Management*. 147 (10) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Lin, Yu-Chien and Lee, Ta-Sung and Ding, Zhi. (2021). Deep Learning for Partial MIMO CSI Feedback by Exploiting Channel Temporal Correlation. *55th Asilomar Conference on Signals, Systems, and Computers*. 345 to 350. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Drake, Christiana. (2022). Marginal Odds Ratio Estimators. *Wiley StatsRef: Statistics Reference Online*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Chamain, Lahiru D. and Qi, Siyu and Ding, Zhi. (2021). An End-to-End Learning Architecture for Efficient Image Encoding and Deep Learning. *29th European Signal Processing Conference (EUSIPCO)*. 691 to 695. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Lin, Yu-Chien and Liu, Zhenyu and Lee, Ta-Sung and Ding, Zhi. (2021). Deep Learning Phase Compression for MIMO CSI Feedback by Exploiting FDD Channel Reciprocity. *IEEE Wireless Communications Letters*. 1 to 1. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/19/2022) Full text Citation details

Liu, Zhenyu and del Rosario, Mason and Ding, Zhi. (2022). A Markovian Model-Driven Deep Learning Framework for Massive MIMO CSI Feedback. *IEEE Transactions on Wireless Communications*. 21 (2) 1214 to 1228. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Bhattacharjee, Satarupa and Liao, Shuting and Paul, Debashis and Chaudhuri, Sanjay. (2022). Inference on the dynamics of COVID-19 in the United States. *Scientific Reports*. 12 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/18/2022) Full text Citation details

Zhang, Songyang and Cui, Shuguang and Ding, Zhi. (2021). Hypergraph Spectral Analysis and Processing in 3D Point Cloud. *IEEE Transactions on Image Processing*. 30 1193 to 1206. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/17/2022) Full text Citation details

Hsieh, Fushing and Chou, Elizabeth P.. (2021). Categorical Exploratory Data Analysis: From Multiclass Classification and Response Manifold Analytics Perspectives of Baseball Pitching Dynamics. *Entropy*. 23 (7) 792. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Chen, Ting-Li and Chou, Elizabeth P. and Fushing, Hsieh. (2021). Categorical Nature of Major Factor Selection via Information Theoretic Measurements. *Entropy*. 23 (12) 1684. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Lopes, Miles E. and Yao, Junwen. (2022). A sharp lower-tail bound for Gaussian maxima with application to bootstrap methods in high dimensions. *Electronic Journal of Statistics*. 16 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Ogugu, Everlyne G and Catz, Sheryl L and Bell, Janice F and Drake, Christiana and Bidwell, Julie T and Gangwisch, James E. (2022). The Association Between Habitual Sleep Duration and Blood Pressure Control in United States (US) Adults with Hypertension. *Integrated Blood Pressure Control*. Volume 15 53 to 66. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Chou, Elizabeth P. and Chen, Ting-Li and Fushing, Hsieh. (2022). Unraveling Hidden Major Factors by Breaking Heterogeneity into Homogeneous Parts within Many-System Problems. *Entropy*. 24 (2) 170. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Oliveira, Luca Cerny and Lai, Zhengfeng and Geng, Wenbo and Siefkes, Heather and Chuah, Chen-Nee. (2021). A Machine Learning Driven Pipeline for Automated Photoplethysmogram Signal Artifact Detection. *2021 IEEE/ACM Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE)*. 149 to 154. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Fannjiang, Albert. (2022). Uniqueness theorems for tomographic phase retrieval with few coded diffraction patterns. *Inverse Problems*. 38 (8) 085008. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/18/2022) Full text Citation details

Lai, Zhengfeng and Wang, Chao and Oliveira, Luca Cerny and Dugger, Brittany N. and Cheung, Sen-Ching and Chuah, Chen-Nee. (2021). Joint Semi-supervised and Active Learning for Segmentation of Gigapixel Pathology Images with Cost-Effective Labeling. *2021 IEEE/CVF International Conference on Computer Vision Workshops (ICCVW)*. 591 to 600. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/19/2022) Full text Citation details

Gallagher, Colin and Killick, Rebecca and Lund, Robert and Shi, Xueheng. (2022). Autocovariance estimation in the presence of changepoints. *Journal of the Korean Statistical Society*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/18/2022) Full text Citation details

Shi, Xueheng and Beaulieu, Claudie and Killick, Rebecca and Lund, Robert. (2022). Changepoint Detection: An Analysis of the Central England Temperature Series. *Journal of Climate*. 1 to 46. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/18/2022) Full text Citation details

Dao, Cecilia and Jiang, Jiming and Paul, Debashis and Zhao, Hongyu. (2022). Variance estimation and confidence intervals from genome-wide association studies through high-dimensional misspecified mixed model analysis. *Journal of Statistical Planning and Inference*. 220 (C) 15 to 23. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/18/2022) Full text Citation details

Leroux, Brett and Rademacher, Luis. (2022). Algebraic k-Sets and Generally Neighborly Embeddings. *Discrete & Computational Geometry*. 67 (2) 605 to 629. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/18/2022) Full text Citation details

Vali, Kourosh and Kasap, Begum and Qian, Weitai and Vafi, Ata and Saffarpour, Mahya and Ghiasi, Soheil. (2021). Estimation of Fetal Blood Oxygen Saturation from Transabdominally Acquired Photoplethysmogram Waveforms *. *43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/18/2022) Full text Citation details

Stocking, Jacqueline C. and Drake, Christiana and Aldrich, J. Matthew and Ong, Michael K. and Amin, Alpesh and Marmor, Rebecca A. and Godat, Laura and Cannesson, Maxime and Gropper, Michael A. and Romano, Patrick S. and Sandrock, Christian and Bime, Christian and Abraham, Ivo and Utter, Garth H.. (2022). Outcomes and risk factors for delayed-onset postoperative respiratory failure: a multi-center case-control study by the University of California Critical Care Research Collaborative (UC3RC). *BMC Anesthesiology*. 22 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Rollins, Zachary A. and Huang, Jun and Tagkopoulos, Ilias and Faller, Roland and George, Steven C.. (2022). A computational algorithm to assess the physiochemical determinants of T cell receptor dissociation kinetics. *Computational and Structural Biotechnology Journal*. 20 (C) 3473 to 3481. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Schonsheck, Stefan C. and Dong, Bin and Lai, Rongjie. (2022). Parallel Transport Convolution: Deformable Convolutional Networks on Manifold-Structured Data. *SIAM Journal on Imaging Sciences*. 15 (1) 367 to 386. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Hacquard, Olympio and Balasubramanian, Krishnakumar and Blanchard, Gilles and Levrard, Clément and Polonik, Wolfgang. (2022). Topologically penalized regression on manifolds. *Journal of machine learning research*. 23 (161) 1 - 39. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Ahmed, Toufique and Devanbu, Premkumar. (2022). Multilingual training for software engineering. *2022 IEEE/ACM 44th International Conference on Software Engineering (ICSE)*. 1443 to 1455. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Youn, Jason and Rai, Navneet and Tagkopoulos, Ilias. (2022). Knowledge integration and decision support for accelerated discovery of antibiotic resistance genes. *Nature Communications*. 13 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text Citation details

Lai, Zhengfeng and Wang, Chao and Hu, Zin and Dugger, Brittany N. and Cheung, Sen-Ching and Chuah, Chen-Nee. (2021). A Semi-supervised Learning for Segmentation of Gigapixel Histopathology Images from Brain Tissues. *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*. 1920 to 1923. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text Citation details

Sanguinetti, Angela and Amenta, Nina. (2022). Nudging Consumers Toward Greener Air Travel by Adding Carbon to the Equation in Online Flight Search. *Transportation Research Record: Journal of the Transportation Research Board*. 2676 (2) 788 to 799. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text Citation details

Wang, Zhongruo and Liu, Bingyuan and Chen, Shixiang and Ma, Shiqian and Xue, Lingzhou and Zhao, Hongyu. (2022). A Manifold Proximal Linear Method for Sparse Spectral Clustering with Application to Single-Cell RNA Sequencing Data Analysis. *INFORMS Journal on Optimization*. 4 (2) 200 to 214. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text   Citation details

Thorpe, Matthew and Nguyen, Tan Minh and Xia, Heidi and Strohmer, Thomas and Bertozzi, Andrea and Osher, Stanley and Wang, Bao. (2022). GRAND++: Graph Neural Diffusion with A Source Term. *International Conference on Learning Representation (ICLR)*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Hass, J. and Thompson, A and Tsietkova, A.. (2021). Tangle decompositions of alternating link complements. *Illinois journal of mathematics*. 65 533-546. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Jesse, Kevin and Devanbu, Premkumar T. and Ahmed, Toufique. (2021). Learning type annotation: is big data enough?. *Proceedings of ESEC/FSE Conference*. 1483 to 1486. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Le, Can M. and Levina, Elizaveta. (2022). Estimating the number of communities by spectral methods. *Electronic Journal of Statistics*. 16 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Balasubramanian, Krishnakumar and Ghadimi, Saeed and Nguyen, Anthony. (2022). Stochastic Multilevel Composition Optimization Algorithms with Level-Independent Convergence Rates. *SIAM Journal on Optimization*. 32 (2) 519 to 544. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Köppe, Matthias and Wang, Jiawei. (2019). Dual-feasible functions for integer programming and combinatorial optimization: Algorithms, characterizations, and approximations. *Discrete Applied Mathematics*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/16/2022) Full text   Citation details

Liew, Zeng and Dan, Shozen and Saito, Naoki. (2022). WaveletsExt.jl: Extending the boundaries of wavelets in Julia. *Journal of Open Source Software*. 7 (69) 3937. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/17/2022) Full text   Citation details

Krebs, Johannes and Roycraft, Benjamin and Polonik, Wolfgang. (2021). On approximation theorems for the Euler characteristic with applications to the bootstrap. *Electronic Journal of Statistics*. 15 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text   Citation details

Xiao, Tesi and Balasubramanian, Krishnakumar and Ghadimi, Saeed. (2022). Improved complexities for stochastic conditional gradient methods under interpolation-like conditions. *Operations Research Letters*. 50 (2) 184 to 189. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text   Citation details

Lai, Zhengfeng and Wang, Chao and Gunawan, Henry and Cheung, Sen-Ching S. and Chuah, Chen-Nee. (2022). Smoothed Adaptive Weighting for Imbalanced Semi-Supervised Learning: Improve Reliability Against Unknown Distribution Data. *Proceedings of Machine Learning Research*. 162 11828 - 11843. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text   Citation details

Roy, Abhishek and Shen, Lingqing and Balasubramanian, Krishnakumar and Ghadimi, Saeed. (2022). Stochastic zeroth-order discretizations of Langevin diffusions for Bayesian inference. *Bernoulli*. 28 (3) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text   Citation details

Kasap, Begum and Vali, Kourosh and Qian, Weitai and Hedriana, Herman L. and Wang, Aijun and Farmer, Diana L. and Ghiasi, Soheil. (2021). Towards Noninvasive Accurate Detection of Intrapartum Fetal Hypoxic Distress. *IEEE 17th International Conference on Wearable and Implantable Body Sensor Networks (BSN)*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/16/2022) Full text   Citation details

Chou, Elizabeth and Hsieh, Yin-Chen and Enriquez, Sabrina and Hsieh, Fushing. (2021). Evaluating reliability of tree-patterns in extreme- *K* categorical samples problems. *Journal of Statistical Computation and Simulation*. 91 (18) 3828 to 3849. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Chen, Shixiang and Deng, Zengde and Ma, Shiqian and So, Anthony Man-Cho. (2021). Manifold Proximal Point Algorithms for Dual Principal Component Pursuit and Orthogonal Dictionary Learning. *IEEE Transactions on Signal Processing*. 69 4759 to 4773. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/15/2022) Full text   Citation details

Eetemadi, Ameen and Tagkopoulos, Ilias. (2021). Methane and fatty acid metabolism pathways are predictive of Low-FODMAP diet efficacy for patients with irritable bowel syndrome. *Clinical Nutrition*. 40 (6) 4414 to 4421. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Ahmed, Toufique and Devanbu, Premkumar and Sawant, Anand Ashok. (2021). Learning to Find Usage of Library Functions in Optimized Binaries. *IEEE Transactions on Software Engineering*. 1 to 1. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Lee, Bo Mi and Eetemadi, Ameen and Tagkopoulos, Ilias. (2021). Reduced Graphene Oxide-Metalloporphyrin Sensors for Human Breath Screening. *Applied Sciences*. 11 (23) 11290. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

de Oliveira, E.B. and Ferreira, F.C. and Galvão, K.N. and Youn, J. and Tagkopoulos, I. and Silva-del-Rio, N. and Pereira, R.V.V. and Machado, V.S. and Lima, F.S.. (2021). Integration of statistical inferences and machine learning algorithms for prediction of metritis cure in dairy cows. *Journal of Dairy Science*. 104 (12) 12887 to 12899. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Liao, Shuting and Koehl, Patrice and Schultens, Jennifer and Hsieh, Fushing. (2021). The geometry of colors in van Gogh's Sunflowers. *Heritage Science*. 9 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/17/2022) Full text   Citation details

Lu, Yu and Balasubramanian, Krishnakumar and Volgushev, Stanislav and Erdogdu, Murat A.. (2021). An Analysis of Constant Step Size SGD in the Non-convex Regime: Asymptotic Normality and Bias. *Advances in neural information processing systems*. 34 . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/16/2022) Full text   Citation details

Kasap, Begum and Vali, Kourosh and Qian, Weitai and Chak, Wai Ho and Vafi, Ata and Saito, Naoki and Ghiasi, Soheil. (2021). Multi-Detector Heart Rate Extraction Method for Transabdominal Fetal Pulse Oximetry. *43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/16/2022) Full text   Citation details

Aue, Alexander and van Delft, Anne. (2020). Testing for stationarity of functional time series in the frequency domain. *The Annals of Statistics*. 48 (5) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Chandler, Gabriel and Polonik, Wolfgang. (2021). Multiscale geometric feature extraction for high-dimensional and non-Euclidean data with applications. *The Annals of Statistics*. 49 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Adler, Ilan and De Loera, Jesús A. and Klee, Steven and Zhang, Zhenyang. (2021). Diameters of Cocircuit Graphs of Oriented Matroids: An Update. *The Electronic Journal of Combinatorics*. 28 (4) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/14/2022) Full text   Citation details

Deng, Xinyi and Chen, Shizhe and Sosa, Marielena and Karlsson, Mattias P. and Wei, Xue-Xin and Frank, Loren M.. (2022). A Variable Clock Underlies Internally Generated Hippocampal Sequences. *The Journal of Neuroscience*. 42 (18) 3797 to 3810. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

McVey, Catherine and Hsieh, Fushing and Manriquez, Diego and Pinedo, Pablo and Horback, Kristina. (2022). Livestock Informatics Toolkit: A Case Study in Visually Characterizing Complex Behavioral Patterns across Multiple Sensor Platforms, Using Novel Unsupervised Machine Learning and Information Theoretic Approaches. *Sensors*. 22 (1) 1. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Haydari, Ammar and Zhang, Michael and Chuah, Chen-Nee. (2021). Adversarial Attacks and Defense in Deep Reinforcement Learning (DRL)-Based Traffic Signal Controllers. *IEEE Open Journal of Intelligent Transportation Systems*. 2 402 to 416. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Ghosh, Subhroshekhar and Balasubramanian, Krishna and Yang, Xiaochuan. (2020). Fractal Gaussian Networks: A sparse random graph model based on Gaussian Multiplicative Chaos. *Proceedings of Machine Learning Research*. 119 3545-3555. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022)
Full text   Citation details

Chen, Ji and Liu, Dekai and Li, Xiaodong. (2020). Nonconvex Rectangular Matrix Completion via Gradient Descent Without $\ell_{2,\infty}$ Regularization. *IEEE Transactions on Information Theory*. 66 (9) 5806 to 5841. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Deng, Shaofeng and Ling, Shuyang and Strohmer, Thomas. (2021). Strong Consistency, Graph Laplacians, and the Stochastic Block Model. *Journal of machine learning research*. 22 (117) 1 - 44. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Chen, Ji and Li, Xiaodong and Ma, Zongming. (2022). Nonconvex Matrix Completion with Linearly Parameterized Factors. *Journal of machine learning research*. 23 (207) 1 - 35. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Aliev, I.. (2020). Optimizing Sparsity over Lattices and Semigroups. *Integer Programming and Combinatorial Optimization. IPCO 2020. Lecture Notes in Computer Science*. 12125 40 - 51. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/14/2022) Full text   Citation details

Trambak Banerjee, Gourab Mukherjee. (2021). Improved Shrinkage Prediction under a Spiked Covariance Structure. *Journal of machine learning research*. 22 (180) 1 - 40. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/14/2022) Full text   Citation details

Chen, Haolin and Rademacher, Luis. (2022). Overcomplete Order-3 Tensor Decomposition, Blind Deconvolution, and Gaussian Mixture Models. *SIAM Journal on Mathematics of Data Science*. 4 (1) 336 to 361. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/15/2022) Full text   Citation details

Boedihardjo, March and Deng, Shaofeng and Strohmer, Thomas. (2021). A Performance Guarantee for Spectral Clustering. *SIAM Journal on Mathematics of Data Science*. 3 (1) 369 to 387. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/15/2022) Full text   Citation details

, Krishnakumar Balasubramanian. (2021). Nonparametric Modeling of Higher-Order Interactions via Hypergraphons. *Journal of machine learning research*. 22 (146) 1 - 35. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/14/2022) Full text   Citation details

Athanasiadis, Christos A. and De Loera, Jesús A. and Zhang, Zhenyang. (2022). Enumerative problems for arborescences and monotone paths on polytope graphs. *Journal of Graph Theory*. 99 (1) 58 to 81. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/14/2022) Full text   Citation details

Wei, Zhenyu and Lee, Thomas C.. (2022). High-Dimensional Multi-Task Learning using Multivariate Regression and Generalized Fiducial Inference. *Journal of Computational and Graphical Statistics*. 1 to 15. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 07/31/2022) Full text   Citation details

Xu, Cong and Lee, Thomas C.. (2022). Change Point Detection and Node Clustering for Time Series of Graphs. *IEEE Transactions on Signal Processing*. 70 3165 to 3180. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 07/08/2022) Full text   Citation details

Hwang, Seungyong and Lai, Randy C. and Lee, Thomas C.. (2022). Generalized Fiducial Inference for Threshold Estimation in Dose–Response and Regression Settings. *Journal of Agricultural, Biological and Environmental Statistics*. 27 (1) 109 to 124. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 07/15/2022) Full text   Citation details

Xu, Cong and Lee, Thomas C.. (2022). Statistical Consistency for Change Point Detection and Community Estimation in Time-Evolving Dynamic Networks. *IEEE Transactions on Signal and Information Processing over Networks*. 8 215 to 227. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, Thomas Chun Man on 07/08/2022) Full text   Citation details

Wu, Suofei and Hannig, Jan and Lee, Thomas C.M.. (2022). Uncertainty quantification for honest regression trees. *Computational Statistics & Data Analysis*. 167 (C) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, null on 12/18/2021) Full text   Citation details

Wang, Chao and Tao, Min and Nagy, James G. and Lou, Yifei. (2021). Limited-Angle CT Reconstruction via the L_1/L_2 Minimization. *SIAM Journal on Imaging Sciences*. 14 (2) 749 to 777. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/03/2021) Full text   Citation details

Balasubramanian, Krishnakumar and Ghadimi, Saeed. (2021). Zeroth-Order Nonconvex Stochastic Optimization: Handling Constraints, High Dimensionality, and Saddle Points. *Foundations of Computational Mathematics*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text   Citation details

Koehl, Patrice and Delarue, Marc and Orland, Henri. (2021). Simultaneous Identification of Multiple Binding Sites in Proteins: A Statistical Mechanics Approach. *The Journal of Physical Chemistry B*. 125 (19) 5052 to 5067. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details

Cloninger, Alexander and Li, Haotian and Saito, Naoki. (2021). Natural Graph Wavelet Packet Dictionaries. *Journal of Fourier Analysis and Applications*. 27 (3) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/22/2021) Full text Citation details

Wang, Xiaokang and Rai, Navneet and Merchel Piovesan Pereira, Beatriz and Eetemadi, Ameen and Tagkopoulos, Ilias. (2020). Accelerated knowledge discovery from omics data by optimal experimental design. *Nature Communications*. 11 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text Citation details

Liu, Zhenyu and Zhang, Lin and Ding, Zhi. (2020). Overcoming the Channel Estimation Barrier in Massive MIMO Communication via Deep Learning. *IEEE Wireless Communications*. 27 (5) 104 to 111. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text Citation details

Langdon, Angela J. and Chaudhuri, Rishidev. (2021). An evolving perspective on the dynamic brain: Notes from the Brain Conference on *Dynamics of the brain: Temporal aspects of computation*. *European Journal of Neuroscience*. 53 (11) 3511 to 3524. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text Citation details

Koehl, Patrice and Orland, Henri and Delarue, Marc. (2021). Parameterizing elastic network models to capture the dynamics of proteins. *Journal of Computational Chemistry*. 42 (23) 1643 to 1661. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text Citation details

Youn, Jason and Naravane, Tarini and Tagkopoulos, Ilias. (2020). Using Word Embeddings to Learn a Better Food Ontology. *Frontiers in Artificial Intelligence*. 3 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) Full text Citation details

Kim, Ki-Jo and Moon, Su-Jin and Park, Kyung-Su and Tagkopoulos, Ilias. (2020). Network-based modeling of drug effects on disease module in systemic sclerosis. *Scientific Reports*. 10 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) Full text Citation details

Schonsheck, Stefan C. and Bronstein, Michael M. and Lai, Rongjie. (2021). Nonisometric Surface Registration via Conformal Laplace–Beltrami Basis Pursuit. *Journal of Scientific Computing*. 86 (3) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/03/2021) Full text Citation details

McNulty, Matthew J. and Kelada, Kirolos and Paul, Debashis and Nandi, Somen and McDonald, Karen A.. (2021). Introducing uncertainty quantification to techno-economic models of manufacturing field-grown plant-made products. *Food and Bioproducts Processing*. 128 (C) 153 to 165. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text Citation details

Su, Yi and Wong, Raymond K. and Lee, Thomas C.. (2020). Network estimation via graphon with node features. *IEEE Transactions on Network Science and Engineering*. 1 to 1. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, null on 07/13/2021) Full text Citation details

Moore, E. and Chaudhuri, R.. (2020). Using noise to probe recurrent neural network structure and prune synapses. *Advances in neural information processing systems*. 34 . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text Citation details

Balasubramanian, K. and Li, T. and Yuan, M.. (2021). On the Optimality of Kernel-Embedding Based Goodness-of-Fit Tests. *Journal of machine learning research*. 22 (1) 1−45. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text Citation details

Le, C. M.. (2021). Edge Sampling Using Local Network Information. *Journal of machine learning research*. 22 1-29. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) Full text Citation details

Lin, Tianyi and Ma, Shiqian and Ye, Yinyu and Zhang, Shuzhong. (2021). An ADMM-based interior-point method for large-scale linear programming. *Optimization Methods and Software*. 36 (2-3) 389 to 424. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) Full text   Citation details

Fong, Daniel D. and Yamashiro, Kaeli J. and Vali, Kourosh and Galganski, Laura A. and Thies, Jameson and Moeinzadeh, Rasta and Pivetti, Christopher and Knoesen, Andre and Srinivasan, Vivek J. and Hedriana, Herman L. and Farmer, Diana L. and Johnson, Michael Austin and Ghiasi, Soheil. (2021). Design and *In Vivo* Evaluation of a Non-Invasive Transabdominal Fetal Pulse Oximeter. *IEEE Transactions on Biomedical Engineering*. 68 (1) 256 to 266. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/28/2021) Full text   Citation details

Lopes, Miles E. and Wu, Suofei and Lee, Thomas C.. (2020). Measuring the Algorithmic Convergence of Randomized Ensembles: The Regression Setting. *SIAM Journal on Mathematics of Data Science.* 2 (4) 921 to 943. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/27/2021) Full text   Citation details

DeMellow, Jacqueline M. and Kim, Tae Youn and Romano, Patrick S. and Drake, Christiane and Balas, Michele C.. (2020). Factors associated with ABCDE bundle adherence in critically ill adults requiring mechanical ventilation: An observational design. *Intensive and Critical Care Nursing*. 60 (C) 102873. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/27/2021) Full text   Citation details

Tatro, N. J. and Schonsheck, S. C. and Lai, R.. (2021). Unsupervised Geometric Disentanglement via CFAN-VAE. *ICLR 2021 Workshop on Geometrical and Topological Representation Learning*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 08/03/2021) Full text   Citation details

Huang, M. and Ma, S. and Lai, L.. (2021). Projection Robust Wasserstein Barycenters. *Proceedings of the 38th International Conference on Machine Learning*. 139 4456-4465. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details

Koehl, Patrice and Orland, Henri. (2021). Fast computation of exact solutions of generic and degenerate assignment problems. *Physical Review E*. 103 (4) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details

Merchel Piovesan Pereira, Beatriz and Wang, Xiaokang and Tagkopoulos, Ilias. (2021). Biocide-Induced Emergence of Antibiotic Resistance in Escherichia coli. *Frontiers in Microbiology*. 12 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) Full text   Citation details

Merchel Piovesan Pereira, Beatriz and Adil Salim, Muhammad and Rai, Navneet and Tagkopoulos, Ilias. (2021). Tolerance to Glutaraldehyde in Escherichia coli Mediated by Overexpression of the Aldehyde Reductase YqhD by YqhC. *Frontiers in Microbiology*. 12 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) Full text   Citation details

Wu, Ping and Jiang, Jiming. (2021). Robust estimation of mean squared prediction error in small-area estimation. *Canadian Journal of Statistics*. 49 (2) 362 to 396. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) Full text   Citation details

Roy, A. and Balasubramanian, K. and Ghadimi, S. and Mohapatra, P.. (2020). Escaping Saddle-Point Faster under Interpolation-like Conditions. *34th Conference on Neural Information Processing Systems (NeurIPS 2020)*. . Status = Added

in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text   Citation details

Huang, Minhui and Ma, Shiqian and Lai, Lifeng. (2021). Robust Low-Rank Matrix Completion via an Alternating Manifold Proximal Gradient Continuation Method. *IEEE Transactions on Signal Processing*. 69 2639 to 2652. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details

Koehl, Patrice and Delarue, Marc and Orland, Henri. (2021). Physics approach to the variable-mass optimal-transport problem. *Physical Review E*. 103 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details

Ahmed, Toufique and Devanbu, Premkumar and Hellendoorn, Vincent J. (2021). Learning lenient parsing & typing via indirect supervision. *Empirical Software Engineering*. 26 (2) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details

Kriener, Birgit and Chaudhuri, Rishidev and Fiete, Ila R.. (2020). Robust parallel decision-making in neural circuits with nonlinear inhibition. *Proceedings of the National Academy of Sciences*. 117 (41) 25505 to 25516. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text   Citation details

Zhang, Songyang and Cui, Shuguang and Ding, Zhi. (2020). Point Cloud Segmentation based on Hypergraph Spectral Clustering. *2020 Information Theory and Applications Workshop (ITA)*. 1 to 1. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text   Citation details

Gao, Qi and Lai, Randy C. and Lee, Thomas C. and Li, Yao. (2020). Uncertainty Quantification for High-Dimensional Sparse Nonparametric Additive Models. *Technometrics*. 62 (4) 513 to 524. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/27/2021) Full text   Citation details

Wu, Suofei and Hannig, Jan and Lee, Thomas C.. (2021). Uncertainty quantification for principal component regression. *Electronic Journal of Statistics*. 15 (1) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, null on 07/13/2021) Full text   Citation details

Moore, Allison H. and Vazquez, Mariel. (2020). A note on band surgery and the signature of a knot. *Bulletin of the London Mathematical Society*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text   Citation details

Townsend, Marilyn S. and Shilts, Mical K. and Lanoue, Louise and Drake, Christiana and Styne, Dennis M. and Woodhouse, Leslie and Ontai, Lenna. (2020). Obesity Risk Assessment Tool among 3–5 Year Olds: Validation with Biomarkers of Low-Grade Chronic Inflammation. *Childhood Obesity*. 16 (S1) S-23 to S-32. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text   Citation details

Li, Haoran and Aue, Alexander and Paul, Debashis. (2020). High-dimensional general linear hypothesis tests via non-linear spectral shrinkage. *Bernoulli*. 26 (4) . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text   Citation details

Hass, J. and Trnkova, M.. (2020). Approximating isosurfaces by guaranteed-quality triangular meshes. *Computer Graphics Forum*. 39 (5) 29 to 40. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/31/2021) Full text   Citation details

Le, Can M. and Levin, Keith and Bickel, Peter J. and Levina, Elizaveta. (2020). Comment: Ridge Regression and Regularization of Large Matrices. *Technometrics*. 62 (4) 443 to 446. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) <u>Full text</u> <u>Citation details</u>

Gu, Xiuye and Luo, Weixin and Ryoo, Michael and Lee, Yong Jae. (2020). Password-Conditioned Anonymization and Deanonymization with Face Identity Transformers. *ECCV 2020*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) <u>Full text</u> <u>Citation details</u>

Zou, X. and Xiao, F. and Yu, Z. and Lee, Y. J.. (2020). Delving Deeper into Anti-aliasing in ConvNets. *Proceedings of the British Machine Vision Conference (BMVC), 2020*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) <u>Full text</u> <u>Citation details</u>

Hsieh, Fushing and Chou, Elizabeth P. and Chen, Ting-Li. (2021). Mimicking Complexity of Structured Data Matrix's Information Content: Categorical Exploratory Data Analysis. *Entropy*. 23 (5) 594. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) <u>Full text</u> <u>Citation details</u>

Fannjiang, Albert and Strohmer, Thomas. (2020). The numerics of phase retrieval. *Acta Numerica*. 29 125 to 228. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/28/2021) <u>Full text</u> <u>Citation details</u>

Risner, Derrick and Li, Fangzhou and Fell, Jason S. and Pace, Sara A. and Siegel, Justin B. and Tagkopoulos, Ilias and Spang, Edward S.. (2021). Preliminary Techno-Economic Assessment of Animal Cell-Based Meat. *Foods*. 10 (1) 3. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) <u>Full text</u> <u>Citation details</u>

Jiang, Jiming and Feuer, Eric J and Li, Yuanyuan and Nguyen, Thuan and Yu, Mandi. (2021). Inference about age-standardized rates with sampling errors in the denominators. *Statistical Methods in Medical Research*. 30 (2) 535 to 548. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) <u>Full text</u> <u>Citation details</u>

Ding, Q. and Hsieh, C.-J. and Sharpnack, J.. (2021). An Efficient Algorithm For Generalized Linear Bandit: Online Stochastic Gradient Descent and Thompson Sampling. *Proceedings of The 24th International Conference on Artificial Intelligence and Statistics*. 130 1585-1593. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 08/04/2021) <u>Full text</u> <u>Citation details</u>

Wang, Chao and Gonzalez, Yesenia and Shen, Chenyang and Hrycushko, Brian and Jia, Xun. (2021). Simultaneous needle catheter selection and dwell time optimization for preplanning of high-dose-rate brachytherapy of prostate cancer. *Physics in Medicine & Biology*. 66 (5) 055028. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/03/2021) <u>Full text</u> <u>Citation details</u>

Liu, Zhenyu and del Rosario, Mason and Liang, Xin and Zhang, Lin and Ding, Zhi. (2020). Spherical Normalization for Learned Compressive Feedback in Massive MIMO CSI Acquisition. *2020 IEEE International Conference on Communications Workshops*. 1 to 6. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) <u>Full text</u> <u>Citation details</u>

Huang, M. and Ma, S. and Lai, L.. (2021). A Riemannian Block Coordinate Descent Method for Computing the Projection Robust Wasserstein Distance. *Proceedings of the 38th International Conference on Machine Learning*. 139 4446-4455. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) <u>Full text</u> <u>Citation details</u>

Lin, Zhenhua and Lopes, Miles E. and Müller, Hans-Georg. (2021). High-Dimensional MANOVA Via Bootstrapping and Its Application to Functional and Sparse Count Data. *Journal of the American Statistical Association*. 1 to 15. Status = Added in

NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details
Haydari, Ammar and Zhang, Michael and Chuah, Chen-Nee and Ghosal, Dipak. (2021). Impact of Deep RL-based Traffic Signal Control on Air Quality. *2021 IEEE 93rd Vehicular Technology Conference (VTC2021-Spring)*. 1 to 6. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/02/2021) Full text   Citation details

Rehm, Gregory B. and Cortés-Puch, Irene and Kuhn, Brooks T. and Nguyen, Jimmy and Fazio, Sarina A. and Johnson, Michael A. and Anderson, Nicholas R. and Chuah, Chen-Nee and Adams, Jason Y.. (2021). Use of Machine Learning to Screen for Acute Respiratory Distress Syndrome Using Raw Ventilator Waveform Data. *Critical Care Explorations*. 3 (1) e0313. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/01/2021) Full text   Citation details

Lopes, M. E. and Erichson, N. B. and Mahoney, M. W.. (2020). Error Estimation for Sketched SVD via the Bootstrap. *Proceedings of the 37th International Conference on Machine Learningg*. 119 6382-6392. Status = Added in NSF-PAR
Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) Full text   Citation details

Joo, Y. B. and Baek, I.-W. and Park, K.-S. and Tagkopoulos, I. and Kim, K.-J.. (2021). Novel classification of axial spondyloarthritis to predict radiographic progression using machine learning. *Clinical and Experimental Rheumatology*. 39 (3) 508-518. Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) Full text   Citation details

Liao, Shuting and Liu, Li-Yu and Chen, Ting-An and Chen, Kuang-Yu and Hsieh, Fushing. (2021). Color-complexity enabled exhaustive color-dots identification and spatial patterns testing in images. *PLOS ONE*. 16 (5) e0251258. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) Full text   Citation details

Hsieh, Fushing and Wang, Xiaodong. (2020). From Learning Gait Signatures of Many Individuals to Reconstructing Gait Dynamics of One Single Individual. *Frontiers in Applied Mathematics and Statistics*. 6 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) Full text   Citation details

He, Y. and Balasubramanian, K. and Erdogdu, M. A.. (2020). On the Ergodicity, Bias and Asymptotic Normality of Randomized Midpoint Sampling Method. *Advances in Neural Information Processing Systems 33 (NeurIPS 2020)*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, null on 07/30/2021) Full text Citation details

Cheung, Rex C. and Aue, Alexander and Hwang, Seungyong and Lee, Thomas C.. (2020). Simultaneous Detection of Multiple Change Points and Community Structures in Time Series of Networks. *IEEE Transactions on Signal and Information Processing over Networks*. 6 580 to 591. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Lee, null on 07/14/2021) Full text   Citation details

Chen, Shixiang and Ma, Shiqian and Xue, Lingzhou and Zou, Hui. (2020). An Alternating Manifold Proximal Gradient Method for Sparse Principal Component Analysis and Sparse Canonical Correlation Analysis. *INFORMS Journal on Optimization*. ijoo.2019.0032. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Singh, K. K. and Mahajan, D. and Grauman, K. and Lee, Y. J. and Feiszli, M. and Ghadiyaram, D.. (2020). Don't Judge an Object by Its Context: Learning to Overcome Contextual Bias. *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Fong, Daniel D. and Yamashiro, Kaeli J. and Johnson, Michael Austin and Vali, Kourosh and Galganski, Laura A. and Pivetti, Christopher D. and Farmer, Diana L. and Hedriana, Herman L. and Ghiasi, Soheil. (2020). Validation of a Novel Transabdominal Fetal Oximeter in a Hypoxic Fetal Lamb Model. *Reproductive Sciences*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text   Citation details

Fong, Daniel D. and Vali, Kourosh and Ghiasi, Soheil. (2020). Contextually-aware Fetal Sensing in Transabdominal Fetal Pulse Oximetry. *2020 ACM/IEEE 11th International Conference on Cyber-Physical Systems (ICCPS)*. 119 to 128. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text   Citation details

Bolya, D. and Zhou, C. and Xiao, F. and Lee, Y. J.. (2019). YOLACT: Real-time Instance Segmentation. *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Chamain, L. D. and Ding, Z.. (2020). Improving Deep Learning Classification of JPEG2000 Images Over Bandlimited Networks. *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. 4062-4066. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Xiao, F. and Liu, H. and Lee, Y. J.. (2019). Identity from here, Pose from there: Self-supervised Disentanglement and Generation of Objects using Unlabeled Videos. *Proceedings of the IEEE International Conference on Computer Vision (ICCV)*. . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Parker-Graham, Christine A. and Eetemadi, Ameen and Yazdi, Zeinab and Marshman, Blythe C. and Loeher, Malina and Richey, Christine A. and Barnum, Samantha and Moore, James D. and Soto, Esteban. (2020). Effect of oxytetracycline treatment on the gastrointestinal microbiome of critically endangered white abalone (Haliotis sorenseni) treated for withering syndrome. *Aquaculture*. 526 (C) 735411. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details

Amenta, Nina and Rojas, Carlos. (2020). Dihedral deformation and rigidity. *Computational Geometry*. 90 (C) 101657. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Yamashiro, Kaeli and Galganski, Laura and Fong, Daniel D. and Ghiasi, Soheil and Lee Farmer, Diana and Stephenson, Jacob and Hirose, Shinjiro and Neff, Lucas and Williams, Timothy and Johnson, M. Austin. (2020). 1168: Fetal tolerance of maternal resuscitative endovascular balloon occlusion of the aorta in a sheep model. *American Journal of Obstetrics and Gynecology*. 222 (S) S718 to S719. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text   Citation details

Jiang, Jiming and Rao, J. Sunil. (2020). Robust Small Area Estimation: An Overview. *Annual Review of Statistics and Its Application*. 7 (1) 337 to 360. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text   Citation details

Fannjiang, Albert and Zhang, Zheqing. (2020). Fixed Point Analysis of Douglas--Rachford Splitting for Ptychography and Phase Retrieval. *SIAM Journal on Imaging Sciences*. 13 (2) 609 to 650. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details

Li, Weilin and Liao, Wenjing and Fannjiang, Albert. (2020). Super-resolution limit of the ESPRIT algorithm. *IEEE Transactions on Information Theory*. 1 to 1. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text Citation details
Fong, Daniel D. and Yamashiro, Kaeli and Johnson, M. Austin and Vali, Kourosh and Galganski, Laura and Pivetti, Christopher and Lee Farmer, Diana and Hedriana, Herman L. and Ghiasi, Soheil. (2020). 98: Validation of a novel transcutaneous fetal oximeter in a hypoxic fetal sheep model. *American Journal of Obstetrics and Gynecology*. 222 (S) S80. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text Citation details

Jiang, Jiming and Torabi, Mahmoud. (2020). Sumca: simple, unified, Monte-Carlo-assisted approach to second-order unbiased mean-squared prediction error estimation. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*. 82 (2) 467 to 485. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text Citation details

Sun, Hanmei and Luan, Yihui and Jiang, Jiming. (2020). A new classified mixed model predictor. *Journal of Statistical Planning and Inference*. 207 (C) 45 to 54. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/11/2020) Full text Citation details

Li, Y. and Singh, K. K. and Ojha, U. and Lee, Y. J.. (2020). MixNMatch: Multifactor Disentanglement and Encoding for Conditional Image Generation. *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text Citation details

Tan, Conghui and Qian, Yuqiu and Ma, Shiqian and Zhang, Tong. (2020). Accelerated dual-averaging primal–dual method for composite convex minimization. *Optimization Methods and Software*. 35 (4) 741 to 766. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text Citation details

Kim, Ki-Jo and Kim, Minseung and Adamopoulos, Iannis E and Tagkopoulos, Ilias. (2019). Compendium of synovial signatures identifies pathologic characteristics for predicting treatment response in rheumatoid arthritis patients. *Clinical Immunology*. 202 (C) 1 to 10. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, null on 08/09/2020) Full text Citation details

Bradley, Richard and Tagkopoulos, Ilias and Kim, Minseung and Kokkinos, Yiannis and Panagiotakos, Theodoros and Kennedy, James and De Meyer, Geert and Watson, Phillip and Elliott, Jonathan. (2019). Predicting early risk of chronic kidney disease in cats using routine clinical laboratory tests and machine learning. *Journal of Veterinary Internal Medicine*. 33 (6) 2644 to 2656. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text Citation details

Prasadan, Arvind and Nadakuditi, Raj Rao and Paul, Debashis. (2020). Sparse equisigned PCA: Algorithms and performance bounds in the noisy rank-1 setting. *Electronic Journal of Statistics*. 14 (1) 345 to 385. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text Citation details

Pereira, B. and Wang, X. and Tagkopoulos, I. (2020). Short- and Long-Term Transcriptomic Responses of Escherichia coli to Biocides: a Systems Analysis. *Journal of applied environmental microbiology*. 86 e00708-20. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text Citation details

Fannjiang, Albert and Chen, Pengwen. (2020). Blind ptychography: uniqueness and ambiguities. *Inverse Problems*. 36 (4) 045005. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text Citation details

Eetemadi, Ameen and Rai, Navneet and Pereira, Beatriz Merchel and Kim, Minseung and Schmitz, Harold and Tagkopoulos, Ilias. (2020). The Computational Diet: A Review of Computational Methods Across Diet, Microbiome, and Health. *Frontiers in Microbiology*. 11 . Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details
Rehm, Gregory B. and Woo, Sang Hoon and Chen, Xin Luigi and Kuhn, Brooks T. and Cortes-Puch, Irene and Anderson, Nicholas R. and Adams, Jason Y. and Chuah, Chen-Nee. (2020). Leveraging IoTs and Machine Learning for Patient Diagnosis and Ventilation Management in the Intensive Care Unit. *IEEE Pervasive Computing*. 19 (3) 68 to 78. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details

Rashid, M. and Kjellstrom, H. and Lee, Y. J.. (2020). Weakly-supervised Action Localization with Graph Convolution Networks. *IEEE Winter Conference on Applications of Computer Vision (WACV)*. . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Khare, Apoorva and Rajaratnam, Bala. (2020). Probability inequalities and tail estimates for metric semigroups. *Advances in Operator Theory*. 5 (3) 779 to 795. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text Citation details

Chen, Shixiang and Ma, Shiqian and Man-Cho So, Anthony and Zhang, Tong. (2020). Proximal Gradient Method for Nonsmooth Optimization over the Stiefel Manifold. *SIAM Journal on Optimization*. 30 (1) 210 to 239. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Chaudhuri, R. and Fiete, I.. (2019). Bipartite expander Hopfield networks as self-decoding high-capacity error correcting codes. *Advances in neural information processing systems*. 32 . Status = Added in NSF-PAR Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/10/2020) Full text   Citation details

Chin, Elizabeth L. and Simmons, Gabriel and Bouzid, Yasmine Y. and Kan, Annie and Burnett, Dustin J. and Tagkopoulos, Ilias and Lemay, Danielle G.. (2019). Nutrient Estimation from 24-Hour Food Recalls Using Machine Learning and Database Mapping: A Case Study with Lactose. *Nutrients*. 11 (12) 3045. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details

Wang, Xiong and Deng, Qi and Ren, Jing and Malboubi, Mehdi and Wang, Sheng and Xu, Shizhong and Chuah, Chen-Nee. (2020). The Joint Optimization of Online Traffic Matrix Measurement and Traffic Engineering For Software-Defined Networks. *IEEE/ACM Transactions on Networking*. 28 (1) 234 to 247. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details

Dette, Holger and Kokot, Kevin and Aue, Alexander. (2020). Functional data analysis in the Banach space of continuous functions. *Annals of Statistics*. 48 (2) 1168 to 1192. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details

Lai, Zhengfeng and Guo, Runlin and Xu, Wenda and Hu, Zin and Mifflin, Kelsey and Dugger, Brittany N. and Chuah, Chen-Nee and Cheung, Sen-ching. (2020). Automated grey and white matter segmentation in digitized Aβ human brain tissue slide images. *2020 IEEE International Conference on Multimedia & Expo Workshops (ICMEW)*. 1 to 6. Status = Added in NSF-PAR

Federal Government's License = Acknowledged. (Completed by Saito, Naoki on 08/09/2020) Full text   Citation details

Roy, A.; Chen, Y.; Balasubramanian, K.; Mohapatra, P. "Online and Bandit Algorithms for Nonstationary Stochastic Saddle-PointOptimization."arXiv preprint arXiv:1912.01698(2019).. Status = OTHER.

Le, C. M.; Li, T. Linear regression and its inference on noisy network-linked data, Journal of the Royal Statistical Society: Series B, 2022.. Status = PUBLISHED.

Li, J.; Balasubramanian, K.; Ma, S. Stochastic Zeroth-order Riemannian Derivative Estimation and Optimization, Mathematics of Operations Research (to appear), 2022; arXiv:2003.11238. Status = PUBLISHED.

Wang, Z.; Balasubramainan, K.; Ma, S.; Razaviyayn, M. Zeroth-Order Algorithms for Nonconvex Minimax Problems with Improved Complexities, accepted in Journal of Global Optimization, 2022. arXiv:2001.07819 [stat.ML], 2020.. Status = PUBLISHED.

Luo, Y. Comparing shapes of high genus surfaces, Asian Journal of Mathematics, arXiv:1910.02215, 2022.. Status = PUBLISHED.

Wang, B.; Ma, S.; Xue, L. Riemannian Stochastic Proximal Gradient Methods for Nonsmooth Optimization over the Stiefel Manifold, accepted in Journal of Machine Learning Research, 2022.. Status = PUBLISHED.

Lei, L.; Li, X.; Lou, X. Consistency of Spectral Clustering on Hierarchical Stochastic Block Models, arXiv:2004.14531, 2020.. Status = OTHER.

Zhang, Z.; Chen, S. "Semiparametric estimation for dynamic network models with shifted connecting intensities," submitted for publication, 2022.. Status = UNDER_REVIEW.

Jiang, Z.; Chen, S.; Ding, P. "An instrumental variable framework for causal inference with point processes." Under review. Journal, 2022.. Status = PUBLISHED.

Köppe, M.; Zhou, Y. "All cyclic group facets inject," arXiv:1807.09758. Submitted to Mathematics of Operations Research, revision in preparation, 2022.. Status = UNDER_REVIEW.

Hildebrand, R.; Köppe, M.; Zhou, Y. "Equivariant perturbation in Gomory and Johnson's infinite group problem. VII. Inverse semigroup theory, closures, decomposition of perturbations," arXiv:1811.06189. Under Review, 2022.. Status = PUBLISHED.

Li, T.; Le, C. M. "Network Estimation by Mixing: Adaptivity and More." accepted for publication, Journal of the American Statistical Association, 2023.. Status = ACCEPTED.

Zhang, C.; Chen, X.; Ma, S. "A Riemannian smoothing steepest descent method for non-Lipschitz optimization on submanifolds," Math. of Operations Research, Accepted for publication, 2021.. Status = ACCEPTED.

Jin, Y.; Xiao, T.; Balasubramanian, K. "Statistical Inference for Polyak-Ruppert Averaged Zeroth-order Stochastic Gradient Algorithm," arXiv:2102.05198 [stat.ML], 2021.. Status = UNDER_REVIEW.

Lou, X.; Hu, Y.; Li, X. "Linear Polytree Structural Equation Models: Structural Learning and Inverse Correlation Estimation," arXiv:2107.10955 [stat.ML], 2021.. Status = UNDER_REVIEW.

Haydari, A.; C. N. Chuah; M. Zhang; J. Macfarlane; S. Peisert, Differential Privacy in Aggregated Mobility Networks: Balancing Privacy and Utility, submitted to IEEE Transactions on Information Forensics & Security, 2023.. Status = UNDER_REVIEW.

Cornuéjols, Gérard; Elçi, Özgün; Köppe, Matthias, "Portfolio optimization in the presence of estimation errors on the expected asset returns," e-print, 2022, available from https://optimization-online.org/2022/02/8794/. Submitted to INFORMS Journal of Optimization.. Status = UNDER_REVIEW.

Jesse, K; Devanbu ,P, "Learning to Predict User-Defined Types", IEEE Transactions on Software Engineering, to appear, 2022.. Status = PUBLISHED.

Roy, Abhishek Roy; Balasubramanian Krishnakumar; Ghadimi, Saeed. "Projection-free Constrained Stochastic Nonconvex Optimization with State-dependent Markov Data," arXiv:2206.11346 [math.OC], 2022.. Status = UNDER_REVIEW.

Huang, Minhui; Ji, Kaiyi; Ma, Shiqian; Lai, Lifeng. "Efficiently Escaping Saddle Points in Bilevel Optimization," 2022. https://arxiv.org/abs/2202.03684. Status = UNDER_REVIEW.

Huang, Minhui; Ma, Shiqian; Lai, Lifeng. "On the Convergence of Projected Alternating Maximization for Equitable and Optimal Transport," 2021. https://arxiv.org/abs/2109.15030. Status = UNDER_REVIEW.

Li, Jiaxiang; Ma, Shiqian. "Federated Learning on Riemannian Manifolds," 2022.. Status = PUBLISHED.

Chen, Xuxing; Huang, Minhui; Ma, Shiqian. "Decentralized Bilevel Optimization with Improved per-Iteration Complexity," Proceedings of the 40th International Conference on Machine Learning, PMLR 202:4641-4671.. Status = PUBLISHED.

Sheng, Junda; Strohmer, Thomas. "Semi-Supervised Clustering of Sparse Graphs: Crossing the Information-Theoretic Threshold," Random Structures & Algorithms, submitted, 2022.. Status = UNDER_REVIEW.

Boedihardjo, March; Strohmer, Thomas; Vershynin. Roman. "Private measures, random walks, and synthetic data," Probability Theory and Related Fields, submitted, 2022.. Status = UNDER_REVIEW.

Hosseini, Elahe; Fang, Ruijie; Zhang, Ruoyu; Chuah, Chen-Nee; Orooji, Mahdi; Rafatirad, Soheil; Rafatirad, Setareh; Homayoun, Houman. "Convolution Neural Network for Pain Intensity Assessment from Facial Expression", Conference: 2022 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC). Status = PUBLISHED.

Xu, Shizhou; Strohmer, Thomas. "Fair Data Representation for Machine Learning at the Pareto Frontier," arXiv:2201.00292 [stat.ML], 2022.. Status = SUBMITTED.

McKee, K. L.; Crandell, I. C.; Chaudhuri, R.; O'Reilly, R. C. (2021). Locally Learned Synaptic Dropout for Complete Bayesian Inference. arXiv:2111.09780.. Status = OTHER.

He, Ye; Balasubramanian, Krishnakumar; Erdogdu, Murat A. "Heavy-tailed Sampling via Transformed Unadjusted Langevin Algorithm," arXiv:2201.08349 [math.ST], 2022.. Status = ACCEPTED.

Zhang, Zitong; Chen, Shizhe. "Semiparametric estimation for dynamic network models with shifted connecting intensities," submitted, 2022.. Status = UNDER_REVIEW.

Jaramillo Rodriguez, E. "Barcode Posets: Combinatorial Properties and Connections," arXiv:2206.05613 (2022).. Status = OTHER.

Huang, Han; Schonsheck, Stefan C.; Lai, Rongjie; Chen, Jie. "G^3: Representation Learning and Generation for Geometric Graphs," 2022.. Status = OTHER.

Leroux, Brett; Rademacher, Luis. "Expansion of random 0/1 polytopes," 2022.. Status = UNDER_REVIEW.

Schonsheck, Stefan C.; Mahan, Scott; Klock, Timo; Cloninger, Alexander; Lai, Rongjie. "Semi-Supervised Manifold Learning with Complexity Decoupled Chart Autoencoders," arXiv:2208.10570 [cs.LG], 2022.. Status = SUBMITTED.

Lai, Z.; Wang, C.; Cheung, S.-C.; Chuah, C.-N. "SaR: Self-Adaptive Refinement on Pseudo Labels for Multiclass-Imbalanced Semi-Supervised Learning," Computer Vision and Pattern Recognition (CVPR) Workshop on Learning with Limited Labeled Data for Image and Video Understanding (L3DIVU), June 20, 2022.. Status = PUBLISHED.

P. Burman: A Hilbert-type inequality for Fourier coefficients, 2022.. Status = OTHER.

Jawaid, M.; Baidya, A.; Jakovcevic, S.; Lusk, J.; Mahboubi-Ardakani, R.; Solomon, N.; Gonzalez, G.; Arsuaga, J.; Vázquez, M.; Davis, R.; Cox, D. (2022). Computational study of the furin cleavage domain of SARS-CoV-2: delta binds strongest of extant variants. https://doi.org/10.1101/2022.01.04.475011. Status = UNDER_REVIEW.

Beaton, N.; Ishihara, K.; Atapour, M.; Eng, J.; Vázquez, M.; Shimokawa, K.; Soteros, C. (January 2022). Entanglement statistics of polymers in a lattice tube and unknotting of 4-plats. arXiv:2204.06186.. Status = UNDER_REVIEW.

Saito, N.; Schonsheck, S. C.; Shvarts, E. "Multiscale transforms for signals on simplicial complexes," Sampling Theory, Signal Processing, and Data Analysis, accepted for publication, 2023. Preprint: arXiv:2301.02136 [cs.SI].. Status = ACCEPTED.

Xiao, Tesi; Xuxing Chen, Krishnakumar Balasubramanian, Saeed Ghadimi, "A one-sample decentralized proximal algorithm for non-convex stochastic composite optimization," Proceedings of the Thirty-Ninth Conference on Uncertainty in Artificial Intelligence, PMLR 216:2324-2334, 2023.. Status = PUBLISHED.

Köppe, Matthias; Martin Koutecký; Krzysztof Sornat; Nimrod Talmon, Fine-Grained Liquid Democracy for Cumulative Ballots, submitted to AAMAS 2024.. Status = SUBMITTED.

Leroux, Brett and Rademacher, Luis, Estranged facets and k-facets of Gaussian random point sets, 2023.. Status = UNDER_REVIEW.

Wijesinghe, A.; S. Zhang; Z. Ding ,"PS-FedGAN: An Efficient Federated Learning Framework with Strong Data Privacy," 38th Annual AAAI Conference on Artificial Intelligence, submitted, 2023.. Status = SUBMITTED.

Zhang, S.; T. Yu; J. Tivald; B. Choi; F. Ouyang; Z. Ding, "Exemplar-Based RadioMap Reconstruction of Missing Areas Using Propagation Priority," 2022 IEEE Global Communications Conference, Rio de Janeiro, Brazil, 2022, pp. 1217-1222.. Status = PUBLISHED.

del Rosario. M.; Ding, Z. "Learning-Based MIMO Channel Estimation UnderPractical Pilot Sparsity and Feedback Compression," in IEEE Transactions on WirelessCommunications, vol. 22, no. 2, pp. 1161-1174, Feb. 2023.. Status = PUBLISHED.

Feres, C.; Z. Ding, "An Unsupervised Learning Paradigm for User Scheduling inLarge Scale Multi-Antenna Systems," in IEEE Transactions on WirelessCommunications, vol. 22, no. 5, pp. 2932-2945, May 2023.. Status = PUBLISHED.

Jing, S.; S. Zhang; Z. Ding, ``Reinforcement Learning for Robust Header Compression under Model Uncertainty'', IEEE Transactions on Wireless Communications, submitted, 2023. Status = SUBMITTED.

Rao, J. S., Li, M. and Jiang, J. (2023), Classified mixed model projections, Journal of the American Statistical Association, in press.. Status = ACCEPTED.

Gonzalez-Isunza, G., Jawaid, M.Z., Liu, P., Cox, D.L., Vazquez, M. and Arsuaga, J., 2023. Using machine learning to detect coronaviruses potentially infectious to humans. Scientific Reports, 13(1), p.9319.. Status = PUBLISHED.

Yu, H., Xiong, J., Ye, A.Y., Cranfill, S.L., Cannonier, T., Gautam, M., Zhang, M., Bilal, R., Park, J.E., Xue, Y. and Polam, V., … 2022. Scratch-AID, a deep learning-based system for automatic detection of mouse scratching behavior with high accuracy. Elife, 11, p.e84042.. Status = PUBLISHED.

Liu P., Lusk J. , Jonoska N. , Vazquez M., Analyzing the link between RNA secondary structures and R-loop formation with tree polynomials. https://www.biorxiv.org/content/10.1101/2023.09.24.559224v1.full.pdf. Status = SUBMITTED.

Vali, Kourosh.; Ata Vafi; Begum Kasap; Soheil Ghiasi. 2023. BASS: Safe Deep Tissue Optical Sensing for Wearable Embedded Systems. ACM Trans. Embed. Comput.Syst. 22, 5s, Article 122 (October 2023).. Status = PUBLISHED.

Wu, Yue; Jesús A. De Loera: Turning Mathematics Problems into Games: Reinforcement Learning and Gröbner bases together solve Integer Feasibility Problems. CoRR abs/2208.12191 (2022) Available at https://arxiv.org/abs/2208.12191. Status = SUBMITTED.

Wu, Yue; Ingrid Brust-Mascher; Melanie Gareau; Jesus A. De Loera; Colin Reardon, "PrestoCell: A persistence-based clustering approach for rapid and robust segmentation of cellular morphology in three-dimensional data," 2023.. Status = SUBMITTED.

Gros, David; Prem Devanbu; Zhou Yu. "AI Safety Subproblems for Software Engineering Researchers." arXiv:2304.14597 (2023).. Status = SUBMITTED.

Even-Zohar, C.;J. Hass, Random Colorings in Manifolds, arXiv:2207.03931.. Status = SUBMITTED.

Hass, J. Surfaces and their Profile Curves, arXiv:2205.01737.. Status = SUBMITTED.

Koehl, P. and Houdoyer, J. Stable evaluation of 3D Zernike moments for surface meshes, Algorithms, 15, 406 (2022). DOI: https://doi.org/10.3390/a15110406. Status = PUBLISHED.

Koehl, P., Akopyan, A, and Edelsbrunner, H. Computing the Volume, Surface Area, Mean, and Gaussian Curvatures of Molecules and Their Derivatives, J. Chem. Inf. Model., 63, 973 (2023). DOI: https://doi.org/10.1021/acs.jcim.2c01346. Status = PUBLISHED.

Koehl, P., Delarue, M., and Orland, H. Computing the Gromov-Wasserstein Distance between Two Surface Meshes Using Optimal Transport, Algorithms, 16, 131 (2023). DOI: https://doi.org/10.3390/a16030131. Status = PUBLISHED.

Hsieh, YC, Delarue, M, Orland, H, and Koehl, P. Analyzing the Geometry and Dynamics of Viral Structures: A Review of Computational Approaches Based on Alpha Shape Theory, Normal Mode Analysis, and Poisson–Boltzmann Theories,

Viruses, 15, 1366 (2023). DOI: https://doi.org/10.3390/v15061366. Status = PUBLISHED.

Koehl, P. and Orland, H. A Physicist's View on Partial 3D Shape Matching, Algorithms, 16, 346 (2023). DOI: https://doi.org/10.3390/a16070346. Status = PUBLISHED.

Roycraft, B., Krebs, J. and Polonik, W. (2023): Bootstrapping persistent Betti numbers and other stabilizing statistics. To appear in Annals of Statistics.. Status = ACCEPTED.

De, A; Chaudhuri, R (2023). Common population codes produce extremely nonlinear neural manifolds. Proc. Natl. Acad. Sci. U.S.A.. Status = ACCEPTED.

McKee, K.L., Crandell, I.C., Chaudhuri, R; O'Reilly, R.C. (2022). Adaptive synaptic failure enables sampling from posterior predictive distributions in the brain. arXiv:2210.01691. Status = SUBMITTED.

He, Yiyun; Thomas Strohmer; Roman Vershynin; Yizhe Zhu. Differentially private low-dimensional representation of high-dimensional data. Submitted, 2023.. Status = SUBMITTED.

Boedihardjo, March; Thomas Strohmer; Roman Vershynin. Covariance loss, Szemeredi regularity, and differential privacy. Submitted, 2023.. Status = SUBMITTED.

Wang, Qingsong; Justin Baker; Martin Berzins; Thomas Strohmer; Bao Wang. Graph Neural Networks with Efficient Global Aggregation via Peaceman-Rachford Splitting. Submitted, 2023.. Status = SUBMITTED.

Feng, Xue; Thomas Strohmer. Improving Autoencoder Image Interpolation via Dynamic Optimal Transport. Submitted, 2023. Status = SUBMITTED.

Jiang, Zhichao; Shizhe Chen; Peng Ding, "An instrumental variable method for point processes: generalized Wald estimation based on deconvolution," Biometrika, 2023.. Status = ACCEPTED.

Fushing H., Chou, E. P-T. and Chen, T-L. (2023) Multiscale major factor selections for complex system data with structural dependency and heterogeneity. Physica A: Statistical Mechanics and its Applications.. Status = SUBMITTED.

Fannjiang, Albert, "3D Tomographic Phase Retrieval and Unwrapping," arXiv:2208.04798.. Status = SUBMITTED.

Haydari, A.; V. Aggarwal; M. Zhang; C-N. Chuah, "Constrained Reinforcement Learning for Fair and Environmentally Efficient Traffic Signal Controllers," submitted to ACM Journal on Autonomous Transportation Systems.. Status = SUBMITTED.

Chan, Trevor; Ilias Tagkopoulos, "A data-driven meal recommendation pipeline", 2023.. Status = UNDER_REVIEW.

Félix Almendra-Hernández, Félix; Jesús A. De Loera; Sonja Petrović. Markov bases: a 25 year update. Submitted, 2023. Status = SUBMITTED.

Licenses

Other Conference Presentations / Papers

Other Products

Other Publications

Patent Applications
Contextually aware fetal sensing in transabdominal fetal pulse oximetry . *Patent No. US16/820,388* . UNITED STATES. Application Date = 03/16/2020 . Status = Submitted

Technologies or Techniques

Thesis/Dissertations
He, Ye. *Advances in Sampling and Stochastic Optimization*. (2023). University of California, Davis. Acknowledgement of Federal Support = Yes

Ding, Qin. *Advances in Stochastic Contextual Bandits*. (2021). University of California, Davis. Acknowledgement of Federal Support = No

Xu, Cong. *Change Point Detection for Image, Graph and Network Data*. (2021). University of California, Davis. Acknowledgement of Federal Support = No

Jaramillo Rodriguez, E.. *Combinatorial Analysis of Barcodes and Interval Graphs for Applications in Data Science*. (2023). University of California, Davis. Acknowledgement of Federal Support = Yes

Zhang, Zhenyang. *Combinatorial and Machine Learning Problems Motivated by the Simplex Method*. (2022). University of California, Davis. Acknowledgement of Federal Support = Yes

Eetemadi, Ameen. *Computational Methods for Optimization of Biological Organisms*. (2021). University of California, Davis. Acknowledgement of Federal Support = No

Liao, Shuting. *Data-driven Computing and Analysis with Contrasting Statistical Developments in Real-world Applications*. (2023). University of California, Davis. Acknowledgement of Federal Support = No

Shvarts, Eugene. *Discrete Integral Operators on Graphs and Multiscale Transforms on Simplicial Complexes*. (2023). University of California, Davis. Acknowledgement of Federal Support = Yes

Leroux, Brett Elliott. *Halving point configurations; techniques from algebraic and convex geometry*. (2021). University of California, Davis. Acknowledgement of Federal Support = Yes

Huang, Minhui. *Minimax problems in Optimal Transport: Algorithm design and convergence analysis*. (2022). University of California, Davis. Acknowledgement of Federal Support = No

Jesse, Kevin. *Modeling Source Code For Developers*. (2023). University of California, Davis. Acknowledgement of Federal Support = No

Tang, Tongyi. *Multiscale Statistical Analysis of Vector Fields on a Sphere with Applications to Geophysics*. (2021). University of California, Davis. Acknowledgement of Federal Support = No

Weber, David S.. *On Interpreting Sonar Waveforms via the Scattering Transform*. (2021). University of California, Davis. Acknowledgement of Federal Support = Yes

Chak, Wai Ho. *On the Crossroads of Scattering Transform and Machine Learning in Image and Signal Processing*. (2023). University of California, Davis. Acknowledgement of Federal Support = Yes

Hu, Rui. *Orthogonal Cone Structure of Dimensionality Reduction Embeddings*. (2023). University of California, Davis. Acknowledgement of Federal Support = No

Deng, Shaofeng. *Performance Analysis of Spectral Clustering*. (2022). University of California, Davis. Acknowledgement of Federal Support = Yes

Sheng, Jun-Da. *Semi-Supervised Clustering of Sparse Graphs: Crossing the Information-Theoretic Threshold*. (2022). University of California, Davis. Acknowledgement of Federal Support = No

Blandino, Andrew. *Some Bootstrap Methods for Regression and Time Series*. (2021). University of California, Davis. Acknowledgement of Federal Support = No

Wei, Zhenyu. *Some Contributions to High-dimensional Statistical Machine Learning*. (2021). University of California, Davis. Acknowledgement of Federal Support = No

Lou, Xingmei. *Statistical Consistency of Structural Learning in Networks and Graphical Models*. (2022). University of California, Davis. Acknowledgement of Federal Support = Yes

Xiao, Tesi. *Towards Computational and Sample Efficiency in Stochastic Optimization*. (2023). University of California, Davis. Acknowledgement of Federal Support = No

Websites or Other Internet Sites

Matthias Köppe, Contributions to SageMath
https://www.sagemath.org

Matthias Köppe, Contributions to SageMath version 9.6 in the form of 127 peer-reviewed change tickets on refactoring, the build/configuration system, and modularization, listed at https://www.sagemath.org/changelogs/sage-9.6.txt, May 2022. Matthias Köppe, Contributions to SageMath version 9.7 in the form of 130 peer-reviewed change tickets on refactoring, the build/configuration system, and modularization, listed at https://www.sagemath.org/changelogs/sage-9.7.txt, September 2022. Matthias Köppe, Contributions to SageMath version 9.8 in the form of 93 peer-reviewed change tickets on refactoring, the build/configuration system, and modularization, listed at https://www.sagemath.org/changelogs/sage-9.8.txt, February 2023. Matthias Köppe, Contributions to SageMath version 10.0 in the form of 67 peer-reviewed pull requests on refactoring, the build/configuration system, and modularization, listed at https://github.com/sagemath/sage/releases/tag/10.0, May 2023. Matthias Köppe, Contributions to SageMath version 10.1 in the form of 74 peer-reviewed pull requests on refactoring, the build/configuration system, and modularization, listed at https://github.com/sagemath/sage/releases/tag/10.1, August 2023.

Matthias Köppe, Contributions to Singular version 4.2.1, 23 pull requests
https://github.com/Singular/Singular

Pull requests: #1018, #1049, #1053, #1054, #1055, #1056, #1057, #1058, #1061, #1063, #1066, #1067, #1072, #1074, #1075, #1076, #1078, #1079, #1080, #1081, #1082, #1084, #1109

MultiscaleSimplexSignalTransforms.jl
https://github.com/UCD4IDS/MultiscaleSimplexSignalTransforms.jl

Signal processing on simplicial complexes, using basis dictionaries formed via hierarchical partitioning. Implemented and maintained by Eugene Shvarts.

Participants/Organizations

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Saito, Naoki	PD/PI	4
Amenta, Annamaria	Co PD/PI	0
Chuah, Chen-Nee	Co PD/PI	1
Lee, Thomas Chun Man	Co PD/PI	1
Arsuaga, Javier	Faculty	1
Aue, Alexander	Faculty	1
Balasubramanian, Krishna	Faculty	1
Burman, Prabir	Faculty	0
Chaudhuri, Rishidev	Faculty	3
Chen, Shizhe	Faculty	1
De Loera, Jesus	Faculty	2

Name	Most Senior Project Role	Nearest Person Month Worked
Devanbu, Premkumar	Faculty	1
Ding, Zhi	Faculty	1
Drake, Christiana	Faculty	0
Fannjiang, Albert	Faculty	3
Ghiasi, Soheil	Faculty	1
Hass, Joel	Faculty	0
Hsieh, Fushing	Faculty	1
Jiang, Jiming	Faculty	1
Koehl, Patrice	Faculty	1
Koeppe, Matthias	Faculty	1
Lai, Lifeng	Faculty	1
Le, Can	Faculty	1
Lopes, Miles	Faculty	1
Paul, Debashis	Faculty	1
Polonik, Wolfgang	Faculty	1
Rademacher, Luis	Faculty	1
Rajaratnam, Balakanapathy	Faculty	1
Schonsheck, Stefan	Faculty	6
Strohmer, Thomas	Faculty	1
Tagkopoulos, Ilias	Faculty	1
Vazquez, Mariel	Faculty	1
Shi, Xueheng	Postdoctoral (scholar, fellow or other postdoctoral position)	2
Almendra Hernandez, Felix	Graduate Student (research assistant)	4

Name	Most Senior Project Role	Nearest Person Month Worked
Bhattacharjee, Samayita	Graduate Student (research assistant)	3
Cai, Wancheng	Graduate Student (research assistant)	3
Chak, Wai Ho	Graduate Student (research assistant)	12
Chan, Trever	Graduate Student (research assistant)	12
Chen, Xuxing	Graduate Student (research assistant)	3
Godkin, Benjamin	Graduate Student (research assistant)	1
Halev, Avishai	Graduate Student (research assistant)	3
Haydari, Ammar	Graduate Student (research assistant)	8
He, Ye	Graduate Student (research assistant)	3
Jaramillo-Rodriguez, Elena	Graduate Student (research assistant)	3
Joarder, Rishad	Graduate Student (research assistant)	11
Knight, Brian	Graduate Student (research assistant)	3
Kumar, Girish	Graduate Student (research assistant)	9
Larsen, Acadia	Graduate Student (research assistant)	1
Liao, Shuting	Graduate Student (research assistant)	3
Pang, Lingyou	Graduate Student (research assistant)	3
Wang, Jue	Graduate Student (research assistant)	9
Wang, Xiawei	Graduate Student (research assistant)	3
Weicht, Tait	Graduate Student (research assistant)	2
Wijesinghe, Achintha	Graduate Student (research assistant)	3

Full details of individuals who have worked on the project:

Naoki Saito
Email: saito@math.ucdavis.edu
Most Senior Project Role: PD/PI
Nearest Person Month Worked: 4

Contribution to the Project: Coordinated and managed almost all the activities of the UCD4IDS; Organized the Joint Mathematics-Statistics Colloquium (Spring 2023); Co-organized ADVANCE Award Symposium: Technology Tools for

Advancing Equity: Artificial Intelligence, Accessibility, and Minimizing Misinformation (Spring 2023); Managed and maintained the dedicated UCD4IDS website as well as its GitHub.com site; Conducted research; supervised one postdoc, three Ph.D. students, and four undergraduate students; gave presentations on our research and projects at various conferences and seminars.

Funding Support: NSF Grant DMS-1912747; NSF Grant IIS-1631329; NSF RTG Grant DMS-1148643; ONR Grant N00014-20-1-2381

Change in active other support: No

International Collaboration: No
International Travel: Yes, Japan - 0 years, 0 months, 14 days; United Kingdom - 0 years, 0 months, 5 days; France - 0 years, 0 months, 7 days

---

Annamaria B Amenta
Email: amenta@cs.ucdavis.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 0

Contribution to the Project: Conducted research; supervised graduate students; attended seminars; participated in the Steering Committee meeting

Funding Support: None

Change in active other support: No

International Collaboration: No
International Travel: No

Chen-Nee Chuah
Email: chuah@ucdavis.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 1

Contribution to the Project: onducted research; supervised postdocs and graduate students; attended seminars

Funding Support: NIH grant 1R21HD099239-01

Change in active other support: No

International Collaboration: No
International Travel: No

Thomas Chun Man Lee
Email: tcmlee@ucdavis.edu
Most Senior Project Role: Co PD/PI
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students and a postdoc; attended seminars

Funding Support: None

Change in active other support: No

International Collaboration: No
International Travel: No

Javier Arsuaga
Email: jarsuaga@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Oversaw and designed studies; ensured the integrity of the research; mentored students and researchers; prepared manuscripts; worked on some experiments required for the COVID-19 project.

Funding Support: NSF grants: DMS-1854770; DMS-2054321

International Collaboration: No
International Travel: No

Alexander Aue
Email: aaue@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students and a postdoc; attended seminars; served as a member of the Steering Committee

Funding Support: None

International Collaboration: No
International Travel: No

Krishna Balasubramanian
Email: kbala@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students and a postdoc; attended seminars

Funding Support: UC Davis CeDAR Innovative Data Science Seed Funding Program; NSF Grant DMS-2053918

International Collaboration: No
International Travel: No

Prabir Burman
Email: pburman@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: Conducted research; co-supervised a graduate student in Biostatistics (Maxime Pouokam); attended seminars; participated in the roundtable discussions

Funding Support: None

International Collaboration: No
International Travel: No

Rishidev Chaudhuri
Email: rchaudhuri@ucdavis.edu

Most Senior Project Role: Faculty
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; supervised graduate students; attended seminars; gave talks

Funding Support: UC Davis Planning Grant for Large Interdisciplinary Applications in Neuroscience (LIAN); UC Davis New Faculty Startup Funds; Sloan Research Fellowship; Air Force Office of Scientific Research

International Collaboration: No
International Travel: No

Shizhe Chen
Email: szdchen@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate and undergraduate students; attended seminars

Funding Support: NSF DMS-1916476

International Collaboration: No
International Travel: No

Jesus De Loera
Email: deloera@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 2

Contribution to the Project: Conducted research; supervised graduate students; attended seminars; participated in the roundtable discussions, helped prepare a new grant for renewal, was active as steering committee member and looking at funding for Math/Applied Math students.

Funding Support: NSF DMS-1818969

International Collaboration: No
International Travel: No

Premkumar Devanbu
Email: ptdevanbu@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Supervised graduate students; attended seminars; participated in the roundtable discussions. Gave tutorial lectures on the use of Docker Containers in Scientific research in some settings.

Funding Support: NSF grants: 1414172; 2107592. A grant from Sandia National Laboratories.

International Collaboration: No
International Travel: No

Zhi Ding
Email: zding@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars; joint work with student and post-doctoral researchers to draft and revise manuscripts for publications; served as a member of the Steering Committee

Funding Support: NSF grants: 1824553, 2009001, 2029037

International Collaboration: No
International Travel: No

Christiana Drake
Email: cmdrake@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: Conducted research; supervised graduate students; attended seminars

Funding Support: CA Dept. Transportation grant 65A0686; US Dept. Veterans Affairs grant 1BX004423-01A1

International Collaboration: No
International Travel: No

Albert Fannjiang
Email: fannjiang@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; supervised graduate students; attended seminars.

Funding Support: Simons Foundation Grant FDN 2019-24

International Collaboration: Yes, Taiwan
International Travel: Yes, Taiwan - 0 years, 1 months, 10 days

---

Soheil Ghiasi
Email: ghiasi@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars; participated in the roundtable discussions

Funding Support: NSF grant CBET-1937158; NIH grant R21HD097467-A1

International Collaboration: No
International Travel: No

Joel Hass
Email: hass@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 0

Contribution to the Project: Conducted research; attended seminars

Funding Support: NSF DMS-1760485 BSF grant 2018313

International Collaboration: No
International Travel: No

Fushing Hsieh
Email: fhsieh@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars

Funding Support: None

International Collaboration: No
International Travel: No

Jiming Jiang
Email: jimjiang@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducting research; Supervising graduate students; Attended seminars

Funding Support: NSF DMS-1713120; DMS-1914465; DMS-2210569

International Collaboration: No
International Travel: No

Patrice Koehl
Email: pakoehl@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars; served as a member of the Steering Committee

Funding Support: NSF grant DMS-1760485 & DMS-1719582

International Collaboration: No
International Travel: No

Matthias Koeppe
Email: mkoeppe@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Developed software; conducted research; supervised graduate students; organized a weekly seminar (Fall 2022); curated a weekly selection of international online research seminars (Fall 2022)

Funding Support: NSF DMS-2012764

International Collaboration: No
International Travel: No

Lifeng Lai
Email: lflai@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars

Funding Support: None

International Collaboration: No
International Travel: No

Can Le
Email: canle@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars

Funding Support: NSF grant DMS-2015134

International Collaboration: No
International Travel: No

Miles Lopes
Email: melopes@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; attended seminars.

Funding Support: NSF grant: DMS-1915786; DOE grant DE-SC0023490

International Collaboration: No
International Travel: No

Debashis Paul
Email: debpaul@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars.

Funding Support: NSF grant DMS-1915894

International Collaboration: No
International Travel: No

Wolfgang Polonik
Email: wpolonik@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars.

Funding Support: None

International Collaboration: No
International Travel: No

Luis Rademacher
Email: lrademac@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars

Funding Support: NSF CCF-2006994

International Collaboration: No
International Travel: Yes, Chile - 0 years, 1 months, 15 days

---

Balakanapathy Rajaratnam
Email: brajaratnam@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; upervised graduate students; attended seminars; involved in curriculum development.

Funding Support: NSF DMS-1916787

International Collaboration: No
International Travel: No

Stefan C. Schonsheck
Email: scschonsheck@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 6

Contribution to the Project: Conducted research: Stability of geometric convolutions, geometric normal flows, Chart-based parameterization of data, Hodge-Decomposition for high-order simplexes, Persistent homology in spherical coordinates, Spectral simplex convolution Organized Mathematics of Data and Decision at Davis (MADDD) seminar series (Spring 2022). Constantly attended One World IMAGINE seminar seris.

Funding Support: Fully supported by the A. J. Krener Assistant Professorship, Department of Mathematics, UC Davis

International Collaboration: No
International Travel: No

Thomas Strohmer
Email: strohmer@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars

Funding Support: NSF-DMS-2027248; NIH-R01HL16351

Ilias Tagkopoulos
Email: itagkopoulos@ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; supervised graduate students; attended seminars.

Funding Support: NSF/USDA/NIH grants

Mariel Vazquez
Email: mariel@math.ucdavis.edu
Most Senior Project Role: Faculty
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research pertaining to Theme 1a: Geometry of Data. Supervised graduate and undergraduate students; attended seminars; applied for extramural funding. Organized ADVANCE Symposium on "Technology Tools for Advancing Equity: Artificial Intelligence, Accessibility, and Minimizing Misinformation ," which was co-organized by PI N. Saito, co-sponsored by TRIPODS, and featured a plenary talk by a UCD4IDS member, J. De Loera.

Funding Support: NSF DMS/NIGMS-2054347; DMS-1817156

Xueheng Shi
Email: xhshi@ucdavis.edu
Most Senior Project Role: Postdoctoral (scholar, fellow or other postdoctoral position)
Nearest Person Month Worked: 2

Contribution to the Project: Conducted research; attended seminars

Funding Support: NSF DMS-2113592 Partially supported by Department of Statistics

---

Felix Almendra Hernandez
Email: falmendrahernandez@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 4

Contribution to the Project: Conducted research; attended seminars

Funding Support: NSF grant DMS-181896

Samayita Bhattacharjee
Email: saabhattacharjee@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended seminars

Funding Support: None

International Collaboration: No
International Travel: No

Wancheng Cai
Email: wccai@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research in generalized fiducial inference in multivariate linear regression.

Funding Support: None

International Collaboration: No
International Travel: No

Wai Ho Chak
Email: wchak@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 12

Contribution to the Project: Conducted research; attended seminars; presented in research symposiums; published research papers

Funding Support: ONR N00014-20-1-2381

International Collaboration: No
International Travel: No

Trever Chan
Email: tchchan@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 12

Contribution to the Project: Conducted research; attended seminars

Funding Support: UC Davis AIFS reward grant

International Collaboration: No
International Travel: No

Xuxing Chen
Email: xuxing@math.ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended seminars

Funding Support: UC Davis Dean's Graduate Summer Fellowship Award

International Collaboration: No
International Travel: No

Benjamin Godkin
Email: bmgodkin@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research

Funding Support: None

International Collaboration: No
International Travel: No

Avishai Halev
Email: ahalev@math.ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; participated in interdisciplinary discussions

Funding Support: None

International Collaboration: No
International Travel: No

Ammar Haydari
Email: ahaydari@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 8

Contribution to the Project: Conducted research; attended seminars.

Funding Support: None

International Collaboration: No
International Travel: No

Ye He
Email: leohe@math.ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended seminars.

Funding Support: None

International Collaboration: No
International Travel: No

Elena Jaramillo-Rodriguez
Email: edgarjr@math.ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended seminars; mentored undergraduate students

Funding Support: NSF AGEP supplement

International Collaboration: Yes, Mexico
International Travel: No

Rishad Joarder
Email: rrjoarder@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 11

Contribution to the Project: Conducted research; attended seminars; participated in group discussions

Funding Support: NSF IIS-1838939, 1937158; Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), USA grant R21HD097467

International Collaboration: No
International Travel: No

Brian Knight
Email: bcknight@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended several workshops

Funding Support: NSF Grant: DMS-1912747

International Collaboration: No
International Travel: No

Girish Kumar
Email: gkum@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 9

Contribution to the Project: Conducted research, learned theory and wrote publication

Funding Support: NSF-DMS-2027248, and R01HL16351

International Collaboration: No
International Travel: No

Acadia Larsen
Email: alarsen@math.ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 1

Contribution to the Project: Conducted research; participated in the roundtable discussions

Funding Support: NSF Award no. 2012764

International Collaboration: No
International Travel: No

Shuting Liao
Email: stliao@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended seminars

Funding Support: NSF grants: DMS-1811405 & CCF-1934568

International Collaboration: No
International Travel: No

Lingyou Pang
Email: lyopang@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended seminars

Funding Support: None

International Collaboration: No
International Travel: No

Jue Wang
Email: jujwang@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 9

Contribution to the Project: Conducted research; attended seminars

Funding Support: None

International Collaboration: No
International Travel: No

Xiawei Wang
Email: xxwwang@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research and finished two manuscripts, attended seminars.

Funding Support: None

International Collaboration: No
International Travel: No

Tait Weicht
Email: weicht@math.ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 2

Contribution to the Project: Conducted research; attended seminars

Funding Support: None

International Collaboration: No
International Travel: No

Achintha H. Wijesinghe
Email: achwijesinghe@ucdavis.edu
Most Senior Project Role: Graduate Student (research assistant)
Nearest Person Month Worked: 3

Contribution to the Project: Conducted research; attended seminars

Funding Support: NSF2009001, NSF2029037, NSF1824553

International Collaboration: No
International Travel: No

What other organizations have been involved as partners?
Nothing to report.

Were other collaborators or contacts involved? If so, please provide details.
Nothing to report

Impacts

What is the impact on the development of the principal discipline(s) of the project?

The theory, algorithms, and software tools that have been and are being developed will be likely to make a positive impact in solving practical data analysis and machine learning problems in our core disciplines, i.e., computer science (analyzing social networks and website links); electrical engineering (monitoring and controlling sensor networks); mathematics (nonconvex optimization theory and algorithms; data analysis on higher-order graphs); and statistics (inverse problems, statistical graph and network analysis).

What is the impact on other disciplines?

Our research and development above will also be likely to make a positive impact on other disciplines, e.g., civil engineering (monitoring traffic flow on a road network); biology and medicine (analyzing data measured on real neural networks, detecting changes in the brain structures due to diseases, imaging live biological cells for analyzing their growth, real-time monitoring of health of fetuses, privacy-protected medical diagnostics); agriculture and veterinary medicine (monitoring and improving milk reproduction management), etc.

What is the impact on the development of human resources?

Through this project, many of our students have become familiar with data obtained from scientists in the different fields such as neuroscience, biomedical engineering, medicine, environmental sciences, and anthropology, etc. Also, through the weekly Mathematics of Data and Decision at Davis (MADDD) seminars, the weekly Statistics seminars, and the annual Joint Mathematics/Statistics Colloquia, students in each of our four departments had opportunities to get to know the students from

the other three departments better. In addition, they had opportunities to meet and discuss with invited speakers from industry to hear their experience in industry and what kind of knowledge and skills are expected in industry.

What was the impact on teaching and educational experiences?

We believe that we, as a group of 35 faculty members, have influenced on the major decision of our campus: we started offering Data Science Undergraduate Major degrees in Fall 2022! The curriculum for this DS major degree will be organized into four initial tracks: 1) Foundations; 2) Agricultural and Environmental Sciences; 3) Biological Sciences; and 4) Social Sciences.
Then, majors in every track will receive ethics training as well as some foundational courses in CS, Math, and Stat, e.g., MAT 19 sequence (Calculus for Data-Driven Applications). About 100 students have enrolled as DS major in Fall 2022 as well as in Fall 2023. We plan to accept about 100 students every year (totaling about 400 undergraduate students eventually).

What is the impact on physical resources that form infrastructure?

The project will contribute the campus-wide High Performance Computing (HPC) Core Facility for their GPU purchase. As we reported in the Major Activities section, more than 30 members of the UCD4IDS created their CPU/GPU cluster accounts at the HPC Core Facility, and started running their jobs on the currently available GPUs. Also, we could finally place our GPU system purchase order this summer. Note that with the promise of this purchase, the HPC Core Facility allowed our members to use their existing GPU system since Winter 2021.

What is the impact on institutional resources that form infrastructure?

UC Davis administration has allocated space for our activities in the first and ground floors of the Physical Sciences and Engineering Library. Currently, the building renovation is 75% completed for this purpose with the planned completion date of December 2023.

What is the impact on information resources that form infrastructure?

Our GitHub.com website, https://github.com/UCD4IDS/, currently lists 12 open-source software packages. Some of our packages, e.g., sage, ContinuousWavelets.jl, and WaveletsExt.jl have been quite popular.

What is the impact on technology transfer?
Nothing to report.

What is the impact on society beyond science and technology?
Nothing to report.

What percentage of the award's budget was spent in a foreign country?
Nothing to report.

Changes/Problems

Changes in approach and reason for change
Nothing to report.

Actual or Anticipated problems or delays and actions or plans to resolve them
Nothing to report.

Changes that have a significant impact on expenditures
Nothing to report.

Significant changes in use or care of human subjects
Nothing to report.

Significant changes in use or care of vertebrate animals
Nothing to report.

Significant changes in use or care of biohazards

Nothing to report.

Change in primary performance site location
Nothing to report.