Shmuel Onn:

A set of points in $\mathbb{R}^d$, p $\quad |\pi| = (|\pi_1|, \ldots, |\pi_p|)$

$\pi = (\pi_1, \ldots, \pi_p)$ partitions

Let $\Lambda \subseteq \mathbb{N}^p_n$ ← partitions p parts such that n elements.

Let A^π $d \times p$ matrices

$$= \left[\sum_{a \in \pi_1} a, \ldots, \sum_{a \in \pi_p} a \right]$$

$C : \mathbb{R}^{d \times p} \longrightarrow \mathbb{R}$

$f(\pi) = C(A^\pi)$ GOAL find π^* $|\pi^*| \in \Lambda$ max $f(\pi)$ over Λ

$d=1$ traveling salesman

$p=2$ max cut.

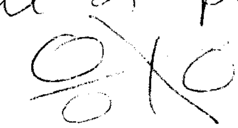
Theorem d, p fixed then you can be solved in polynomial time.

$$P_A^p = \operatorname{conv}\{ A^\pi : p\text{-partition of } A \} \subseteq \mathbb{R}^{d \times p}$$

π extremal is A^π vertex.

Theorem: $O(n^{d\binom{p}{2}})$ extremal characterization

extremal $\Rightarrow$ convex hull of parts can be separated!



$e_d^p(n) =$ max # extremal ~~pp~~partitions of n-sets in $\mathbb{R}^d$

$S_d^p(n) =$ max # separable

$e \leq S$!!