

Symmetric Gauge Functions & Unitarily Invariant Norms

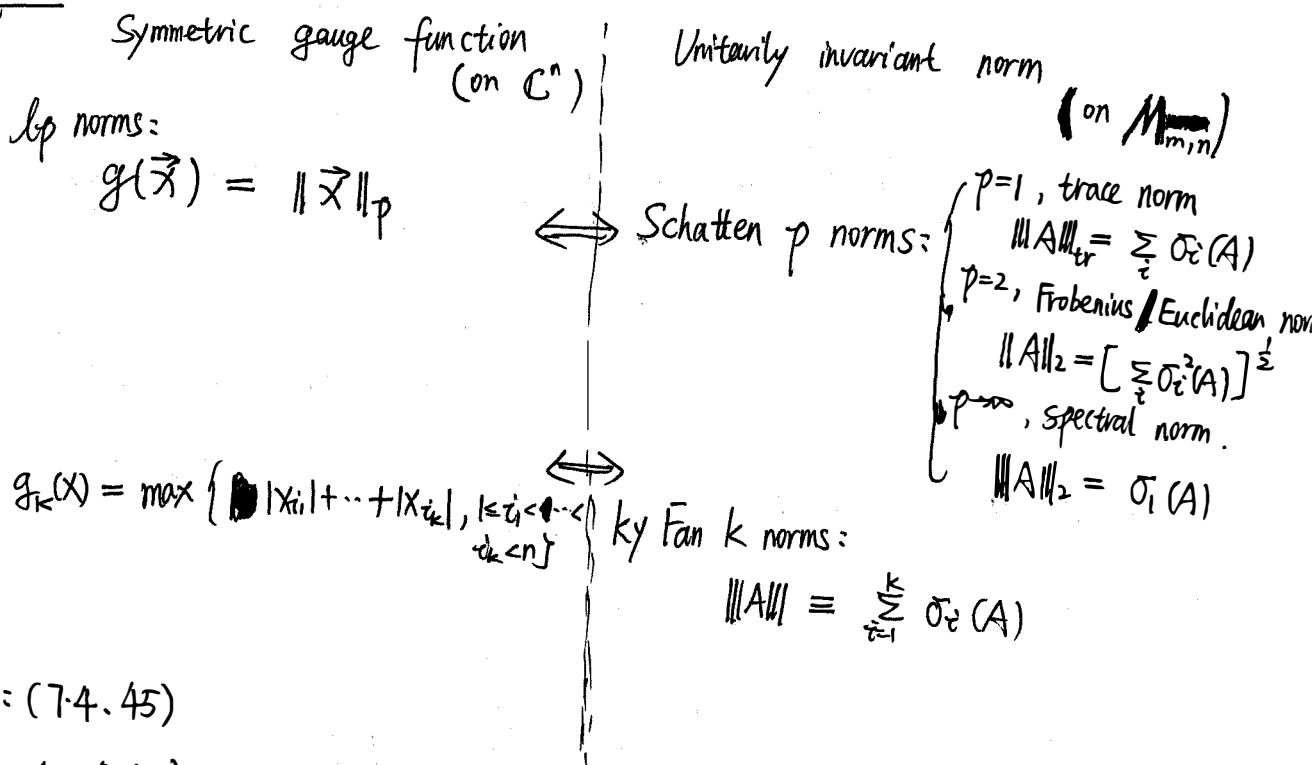
Def: (7.4.16) Unitarily invariant norm.

Def: (7.4.23) Symmetric ~~gauge~~ gauge function

Thm: (7.4.24)

(Main idea): ~~$N(\cdot)$~~ $N(\cdot)$ is a function on $M_{m,n}$, then
 $N(\cdot)$ is a unitarily invariant norm $\iff N(A)$ is a symmetric gauge function on the set of SV. of A .

Examples:



Thm: (7.4.45)

Cor: (7.4.47)

(main idea) $\|A\| \leq \|B\|$, \forall unitarily invariant norm $\|\cdot\|$ on $M_{m,n}$



The inequality hold for Ky Fan k norms ($k=1, 2, \dots, \min\{m, n\}$)

~~Lemma (7.4.50)~~

Thm: (7.4.51)

$\|A-B\| \geq \|\Sigma(A) - \Sigma(B)\|$, \forall unitarily invariant norm.