

$$\begin{array}{l}
A\\
\lambda_{min}(A)\\
\lambda_{max}(A)\\
A\\
\lambda_{min}(A)=\\
\min x^TAx\\
s.t.||x||^2=\\
1,\\
\lambda_{max}(A)=\\
\max x^TAx\\
s.t.||x||^2=\\
1,\\
x^*\\
A\in\\
R^{n\times n}\\
B\in\\
R^{n\times n}\\
\lambda\\
(A,B)\\
q\in\\
R^{n\times n}\\
Aq=\\
\lambda Bq\\
q\\
\lambda\\
\lambda\\
(A,B)\\
\lambda\\
det(A-\\
\lambda B)=\\
0\\
(A,B)\\
det(A-\\
\lambda B)\\
\lambda\\
det(A-\\
\lambda B)\neq\\
0\\
(A,B)\\
(A,B)\\
\lambda\in\\
R\\
(A,B)\\
B\\
(A,B)\\
AB^{-1}\\
B^{-1}A\\
B\\
P(\lambda)=\\
det(A-\\
\lambda B)\\
p\\
r\\
P(\lambda)\\
(A,B)\\
(n-\\
r)\\
\infty\\
A=\\
\frac{1}{2}I\\
B=\\
\frac{1}{10}I\\
\frac{1}{10}I\\
det(A-\\
\lambda B)=\\
2-\\
\lambda\\
(A,B)\\
\infty\\
A=\\
\frac{1}{11}I\\
\frac{1}{10}I\\
B=\\
\frac{1}{10}I\\
\frac{1}{10}I\\
det(A-\\
\lambda B)=\\
-1\\
(A,B)\\
\infty\\
?\\
I\\
f_i(x),i\in\\
I\\
S\\
f(x)=\\
\max_{i\in I}f_i(x)\\
S\\
f\\
-f\\
I
\end{array}$$

$$\min_{y\in I}f_y(x)$$

$$f_y(x)=y^TA_0y+x_1y^TA_1y+\cdots+x_ny^TA_ny.$$

$$\begin{array}{l} y\in\\ I\\ f_y(x)\\ ??\\ f(x)\\ S\\ H^n\\ f\\ S\\ \xi\\ f\\ \bar{x}\in\\ S\\ \end{array}$$

$$f(x)\geq f(\bar{x})+\xi^T(x-\bar{x}),\forall x\in S.$$

$$\begin{array}{l} f\\ S\\ \xi\\ f\\ \bar{x}\in\\ S\\ \end{array}$$

$$f(x)\leq f(\bar{x})+\xi^T(x-\bar{x}),\forall x\in S.$$

$$\begin{array}{l} f\\ \bar{x}\\ \partial f(\bar{x})\\ f\\ D\\ R^n\\ f\\ \bar{x}\in\\ int(S)\\ \nabla f(\bar{x})\\ Q^n\rightarrow\\ R\\ \bar{x}\in\\ S\\ f(x)=f(\bar{x})+\nabla f(\bar{x})^T(x-\bar{x})+||x-\bar{x}||\alpha(\bar{x},x-\bar{x}), \end{array}$$

$$\lim_{x\rightarrow\bar{x}}\alpha(\bar{x},x-$$

$$\bar{x})=\\ 0\\ \nabla f(\bar{x})$$

$$\begin{array}{l} f\\ \bar{x}\\ S\\ R^n\\ f\\ S\\ \end{array}$$

$$\begin{array}{l} f\\ \bar{x}\in\\ int(S)\\ \end{array}$$

$$\begin{array}{l} f\\ \bar{x}\\ \partial f(\bar{x})\\ \{\nabla f(\bar{x})\}\\ \end{array}$$

$$\begin{array}{l} I\\ f_i(x),\,i\in\\ I\\ S\\ \end{array}$$

$$\begin{array}{l} f(x)=\\ \max_{i\in I}f_i(x)\\ \end{array}$$

$$\begin{array}{l} f\\ \bar{x}\\ \partial f(\bar{x})\\ \end{array}$$

$$\partial f(\bar{x})=Conv\left(\bigcup_{i\in T}\partial f_i(\bar{x})\right),$$

$$\begin{array}{l} T=\\ \{i\in\\ I|f_i(\bar{x})=\\ f(\bar{x})\}\\ f(x)=\\ \lambda_{min}(A(x))\\ A(x)=\\ A_0+\\ x_1A_1+\\ \cdots+\\ x_nA_n\\ i=\\ 1,...,n\\ A_i\in\\ R^{m\times m}\\ \mathcal{R}^{\ell(-)} \end{array}$$