

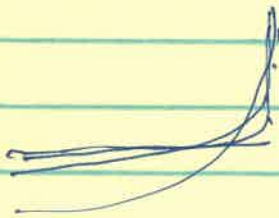
$$g(y) = f(Fy + x_0)$$

$$\nabla^2 g(y) = F^T \underbrace{\nabla^2 f(Fy + x_0)}_{} F$$

unconstrained	constrained
$\nabla^2 f(x) v = -\nabla f(x)$	$\begin{bmatrix} \nabla^2 f(x) & A^T \\ A & 0 \end{bmatrix} \begin{bmatrix} v \\ w \end{bmatrix} = \begin{bmatrix} -\nabla f(x) \\ 0 \end{bmatrix}$

$$\phi(x) = -\sum \log(-h_i(x))$$

$$\begin{aligned} \min_x & \quad \frac{f(x) + \frac{1}{\epsilon} \phi(x)}{\epsilon} \\ \text{s.t.} & \quad Ax = b \end{aligned}$$



$$\min_x \quad c^T x$$

$$\begin{aligned} \text{s.t.} \quad Dx \leq e \quad \text{or} \quad d_i^T x \leq e_i \quad i=1, \dots, m \\ e_i - d_i^T x \geq 0 \end{aligned}$$

$$\phi(x) = -\sum \log(e_i - d_i^T x)$$

$$\begin{aligned} \min & f(x) \\ \text{st.} & h_i(x) \leq 0 \quad i=1, \dots, m \\ & Ax = b. \end{aligned}$$

KKT cond's: stat ✓
 comp slackness. ←
 p feas ✓
 d feas ✓

usual: $u_i h_i(x) = 0. \quad i=1, \dots, m$ } perturbed: $u_i - h_i(x) = -\gamma t \quad i=1, \dots, m$

• update $t^{(k)} = \mu t^{(k-1)}$
