Convex Optimization notes

Mac Radigan

Convex Optimization

Infeasible Start Newton Method

Algorithm 1 Infeasible Start Newton Method

given $x \in f, \nu, \epsilon < 0, \alpha \in \left(0, \frac{1}{2}\right), \beta \in (0,1)$
repeat
1. compute primal and dual Newton steps Δx_{NT} and $\Delta \nu_{NT}$
2. backtracking line search on $\|r\|_2$
t := 1
while $\|r\left(x + t\Delta x_{NT}, \nu + t\Delta \nu_{NT}\right)\|_2 > (1 - \alpha t)\|r\left(x, \nu\right)\|_2$ **do**
$t := \beta t$
end while
3. update $x := x + t\Delta x_{NT}$ and $\nu := \nu + t\Delta \nu_{NT}$
until $Ax = b$ **and** $\|r\left(x, \nu\right)\| \leq \epsilon$