

ME 555 LIST OF CONCEPTS (2)

BOUNDARY OPTIMA

(Ch. 5)

Feasible direction
Feasible descent
Linearly independent constraints
Functionally independent constraints
Regularity assumption
(constraint qualification)
Tangent and normal hyperplanes
Reduced gradient
Reduced Hessian
Necessary and sufficient conditions

Lagrangian function
Lagrangian standard forms
Lagrange multipliers
KKT Conditions
Geometric interpretation of KKT conditions
Estimates of Lagrange Multipliers
Sensitivity coefficients
Degeneracy
Linear programming problems

MODELS & COMPUTATION

(Ch.8; discussed throughout the term)

Setting simple bounds
Dividing by possibly zero terms
Dealing with integers
Definition equations vs. equality constraints
Minmax formulations
Asymptotic substitutions
Variable transformations
Feasible domain reduction
via constraint interaction
Confirming active constraints
Scaling variables
Scaling constraints

Scaling the objective
Scaling vs. termination criteria
Finite differencing

OPTIMIZATION ALGORITHMS

(Ch.5 and 7)

Local vs. global convergence
Termination criteria
Ill-conditioning
One-dimensional minimization
Bracketing, Sectioning, Interpolation
Bisection method
Quadratic interpolation
Cubic interpolation
Davies, Swann and Campey method

Line search
Exact vs. inexact line search
Inexact line search
Armijo-Goldstein criteria
Armijo line search

Quasi-Newton methods
DFP, BFGS updates

Generalized reduced gradient
state and decision variable partitioning
failure of partitioning
descent step
feasibility recovery
step reduction
active set strategy

Active set strategy (general)
adding constraints
deleting constraints

Sequential quadratic programming
Lagrange-Newton equations
QP subproblem
merit function
line search