ıth 664, Spring, 2002
.obal Optimization and Semi-definite programming
ıstructor: Leonid Faybusovich

extbook: J. Renegar Mathematical Aspects of Interior-point Algorithms of
)timization, SIAM 2001

ıe goal of this course is to describe recent applications of interior-point
.gorithms to global (i.e. nonconvex optimization problems. We start with a
etailed discussion of the semi-definite programming, i.e. the problem of
)timization of a linear function on a feasible set obtained as an intersectio
: an affine subspace with the cone of nonnegative definite symmetric matrices
e discuss several recent techniques for reducing various classes of
)timization problems arising in control theory, robotics, statistics,
)mputational geometry, economics to semi-definite programming problems. We th
:oceed with the discussion of several classes of interior-point algorithms
)rimal-dual, path-following, potential-reduction etc) as tools for solving
emi-definite programming problems. Our main topic is the discussion of semi-
efinite relaxations as a rigorous tool for obtaining estimates for optimal
)lutions to a number of important global optimization problems:nonconvex
:oblems with quadratic constraints and max-cut type combinatorial optimizatio
:oblems with applications to circuit design.

:erequisites: An undergraduate course in linear algebra