

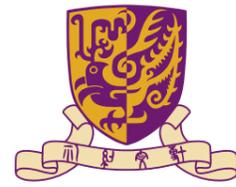
INC Distinguished Lecture

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Convex Optimization

Professor Stephen P. Boyd

Samsung Professor of Engineering and
Professor of Electrical Engineering, Stanford University

Date: September 15, 2017 (Friday)

Time: 3:30 - 4:45 pm

Venue: TY Wong Hall, 5/F

Ho Sin Hang Engineering Building

The Chinese University of Hong Kong



Abstract:

Convex optimization has emerged as useful tool for applications that include data analysis and model fitting, resource allocation, engineering design, network design and optimization, finance, and control and signal processing. After an overview of the mathematics, algorithms, and software frameworks for convex optimization, we turn to common themes that arise across applications, such as sparsity and relaxation. We describe recent work on real-time embedded convex optimization, in which small problems are solved repeatedly in millisecond or microsecond time frames, and large-scale distributed convex optimization, in which many solvers are coordinated to solve enormous problems.

Enquiry:

Prof. Raymond W. Yeung
Institute of Network Coding

Email: whyeung@ie.cuhk.edu.hk

Biography

Stephen P. Boyd is the Samsung Professor of Engineering, and Professor of Electrical Engineering in the Information Systems Laboratory at Stanford University. He has courtesy appointments in the Department of Management Science and Engineering and the Department of Computer Science, and is member of the Institute for Computational and Mathematical Engineering. His current research focus is on convex optimization applications in control, signal processing, machine learning, and finance.

Professor Boyd received an AB degree in Mathematics, summa cum laude, from Harvard University in 1980, and a PhD in EECS from U. C. Berkeley in 1985. In 1985 he joined the faculty of Stanford's Electrical Engineering Department. He has held visiting Professor positions at Katholieke University (Leuven), McGill University (Montreal), Ecole Polytechnique Federale (Lausanne), Tsinghua University (Beijing), Universite Paul Sabatier (Toulouse), Royal Institute of Technology (Stockholm), Kyoto University, Harbin Institute of Technology, NYU, MIT, UC Berkeley, CUHK-Shenzhen, and IMT Lucca. He holds honorary doctorates from Royal Institute of Technology (KTH), Stockholm, and Catholic University of Louvain (UCL).

Professor Boyd is the author of many research articles and three books: Convex Optimization (with Lieven Vandenbergh, 2004), Linear Matrix Inequalities in System and Control Theory (with L. El Ghaoui, E. Feron, and V. Balakrishnan, 1994), and Linear Controller Design: Limits of Performance (with Craig Barratt, 1991). His group has produced many open source tools, including CVX (with Michael Grant), CVXPY (with Steven Diamond) and Convex.jl (with Madeleine Udell and others), widely used parser-solvers for convex optimization.

Professor Boyd has received many awards and honors for his research in control systems engineering and optimization, including an ONR Young Investigator Award, a Presidential Young Investigator Award, and the AACC Donald P. Eckman Award. In 2013, he received the IEEE Control Systems Award, given for outstanding contributions to control systems engineering, science, or technology. In 2012, Michael Grant and he were given the Mathematical Optimization Society's Beale-Orchard-Hays Award, given every three years for excellence in computational mathematical programming. He is a Fellow of the IEEE, SIAM, and INFORMS, a Distinguished Lecturer of the IEEE Control Systems Society, and a member of the US National Academy of Engineering. He has been invited to deliver more than 90 plenary and keynote lectures at major conferences in control, optimization, signal processing, and machine learning.

He has developed and taught many undergraduate and graduate courses, including Signals & Systems, Linear Dynamical Systems, Convex Optimization, and a recent undergraduate course on Matrix Methods. His graduate convex optimization course attracts 300 students from 25 departments. In 1991 he received an ASSU Graduate Teaching Award, and in 1994 he received the Perrin Award for Outstanding Undergraduate Teaching in the School of Engineering. In 2003, he received the AACC Ragazzini Education award, for contributions to control education, with citation: "For excellence in classroom teaching, textbook and monograph preparation, and undergraduate and graduate mentoring of students in the area of systems, control, and optimization." In 2016 he received the Walter J. Gores award, the highest award for teaching at Stanford University, with (excerpt from) citation "For revolutionizing the way mathematical optimization is taught and applied in engineering and the social and natural sciences worldwide; For the brilliance, clarity and humor with which he presents mathematically advanced topics, makes them accessible and interesting to students in many fields." In 2017 he received the IEEE James H. Mulligan, Jr. Education Medal, for a career of outstanding contributions to education in the fields of interest of IEEE, with citation "For inspirational education of students and researchers in the theory and application of optimization."

His website, which makes available past papers, books, software, lecture notes, and selected lecture videos, is visited more than 1.6 million times per year, not counting accesses to iTunes U, YouTube, Stanford Engineering Everywhere, MIT Open Course Ware, and Stanford Online/edX, which include courses developed and delivered by Boyd.

At Stanford he has served as director of the Information Systems Laboratory, chair of the (university wide) Library Committee, chair of the David Packard EE Building Planning & Design Committee, and as a member of the (university wide) Advisory Board.