
Session Information : Monday Nov 14, 08:00 - 09:30

Title: 50th Anniversary of Studies in the Economics of Transportation

Chair: Anna Nagurney, Professor, University of Massachusetts Amherst, Department of Finance and Operations Man, Isenberg School of Management, Amherst MA 01003, United States, nagurney@gbfin.umass.edu

Co-Chair: David Boyce, Professor, Northwestern University, 2149 Grey Avenue, Dept. of Civil and Environmental Engrg., Evanston IL 60201, United States, d-boyce@northwestern.edu

Abstract Details

Title: Insights into the Why, How and When of the Network Equilibrium Model

Lead: David Boyce, Northwestern University, 2149 Grey Avenue, Evanston IL 60201, United States, dboyce@uic.edu

Abstract: Based on interviews with its creators, and examination of original and contemporary materials, this talk explores why, how and when the formulation of the user-equilibrium model with variable flows occurred, and the relation of its invention to the system-optimal model. The context of the research with respect to the objectives of its sponsors and the unrelated initiation of urban transportation planning studies for American metropolitan areas is also examined.

Title: Network Equilibrium Models: Varied and Ambitious

Lead: Michael Florian, Professor, University of Montreal, Montreal QC H3C 3J7, Canada, mike@crt.umontreal.ca

Abstract: The use of network equilibrium models for the static simulation of traffic on urban road networks has become an accepted practice. The user equilibrium principle has been extended to transit route choice models and to dynamic traffic assignment models. Some of these models are quite ambitious and test the limits of the theoretical knowledge.

Title: The Sensitivity of Traffic Equilibria - History and the Current Status

Lead: Michael Patriksson, Professor of applied mathematics, Chalmers University of Technology, Department of mathematics, Gothenburg SE-412 74, Sweden, mipat@math.chalmers.se

Abstract: Since Braess' paradox became known in the late 1960s the sensitivity of traffic equilibrium flows, demands and travel times to changes in the data of a traffic model has been studied and analyzed. Quantitative theoretical studies in this field began in earnest following the work of Fiacco on the sensitivity analysis of nonlinear programs, among the first publications being the highly influential paper by Tobin and Friesz (1988). The talk presents the history and state-of-the-art of sensitivity analysis of traffic equilibria, with emphasis on the later developments on providing the mildest possible conditions for directional derivatives to exist, and analyses of extensions of the basic model. Numerical examples highlight the strength and possible uses of the most recent results.

Title: A Retrospective on Beckmann, McGuire and Winsten's Studies in the Economics of Transportation

Lead: Anna Nagurney, Professor, University of Massachusetts Amherst, Department of Finance and Operations Man, Isenberg School of Management, Amherst MA 01003, United States, nagurney@gbfin.umass.edu

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Hani Mahmassani, Maryland Transportation Initiative, University of Maryland, College Park MD 20742, United States, masmah@umd.edu

Abstract: This paper describes the impact and influence of the book, Studies in the Economics of Transportation, by M. Beckmann, C. B. McGuire and C. B. Winsten, published in 1956 by Yale University Press. The focus of this paper is on the book's impacts on innovations in modeling, methodological developments, and applications which continue to this day.

Session Information : Monday Nov 14, 10:00 - 11:30

Title: 50th Anniversary of Studies in the Economics of Transportation

Chair: Anna Nagurney, Professor, University of Massachusetts Amherst, Department of Finance and Operations Man, Isenberg School of Management, Amherst MA 01003, United States, nagurney@gbfn.umass.edu

Co-Chair: David Boyce, Professor, Northwestern University, 2149 Grey Avenue, Dept. of Civil and Environmental Engrg., Evanston IL 60201, United States, d-boyce@northwestern.edu

Abstract Details

Title: Recent Results on Congestion Toll Pricing of Traffic Networks

Lead: Don Hearn, Professor and Chair, U. of Florida, ISE Department, 303 Weil Hall, Gainesville FL 32611, United States, hearn@ise.ufl.edu

Abstract: We will summarize results on congestion pricing for fixed and elastic demand traffic assignment models, as well as results on approximations of toll sets, extensions to second-best pricing, dynamic pricing, and a traffic-transit model that combines tolling on urban streets with the setting of transit fares. This research has been in collaboration with P. Bergendorff, M. Ramana, M. B. Yildirim, L. Bai, S. Lawphongpanich, Y. Hamdouch, A. Nahapetyan, and M. Florian.

Title: Beyond Equilibrium: User Adjustment Processes and Day-to-day Dynamics

Lead: Hani Mahmassani, Maryland Transportation Initiative, University of Maryland, College Park MD 20742, United States, masmah@umd.edu

Abstract: This talk highlights BMW's lesser known but no less seminal contribution to the understanding of day to day dynamics of network flows under different user adjustment processes, and discusses recent developments, challenges and opportunities in this exciting area.

Title: Quantifying the Worst-Case Inefficiency of Wardrop Equilibria

Lead: Tim Roughgarden, Assistant Professor, Stanford University, Department of Computer Science, 462 Gates Building, 353 Serra Mall, Stanford CA 94305, United States, tim@theory.stanford.edu

Abstract: At least since the book "The Economics of Welfare", published in 1920 by A. C. Pigou, Wardrop equilibria have been known to be inefficient. We discuss recent work, done primarily in the theoretical computer science community, that aims to quantify the worst-possible severity of this inefficiency. We will highlight the role played by the "potential function" for Wardrop equilibria that was originally introduced in the book of Beckmann, McGuire, and Winsten.

Title: Reflections on Our Book and the Past 50 Years

Lead: Martin Beckmann, Professor Emeritus, Department of Economics, 64 Waterman Street, Brown University, Providence RI 02912, gwenypretzsch@yahoo.com

Co-Author: C. Bart McGuire, Professor Emeritus, Goldman School of Public Policy, 2607 Hearst Avenue, University of California, Berkeley CA 94720-7320, bmcguire@uclink4.berkeley.edu

Abstract: The two living authors of Studies in the Economics of Transportation will reflect and comment on the writing of their book and offer their reflections on its impact.