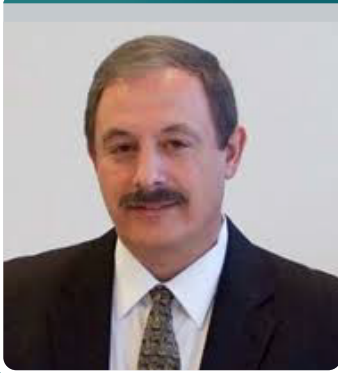




KEYNOTE SPEAKERS




Prof. Mohammad Shahidehpour

Distinguished Professor, Illinois Institute of Technology,
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Keynote Presentation Title

**“Coordinated Planning of Transportation and
Electric Power Networks with the
Proliferation of Electric Vehicles”**

 **16 March 2022**

 **18:00 - 18:45**
(GMT+3)

Abstract

As an environment-friendly and energy-saving alternative in the transportation industry, electric vehicles (EVs) are drawing additional attention, especially with ongoing developments in battery technologies. However, large-scale proliferation of EVs can also alter the electric power load profile, tighten the interdependency of transportation and electric power networks, and introduce socioeconomic concerns in the expansion of the two networks. The proliferation of EVs could also have a critical impact on power system peak load, frequency regulation, voltage quality, and electric power congestion. This talk will present the enhanced numerical solution for the coordinated planning of electric power lines, transportation roads, energy storage systems and fast charging stations. We introduce the application of the linear optimization theory including Karush-Kuhn-Tucker conditions, the big M method, and a linear expression for power losses to transform the nonlinear planning problem into a mixed-integer quadratically constrained programming (MIQCP) formulation, which is solved by commercial solvers. The proposed MIQCP formulation is decomposed by Lagrangian relaxation into the two respective subproblems for transportation and electric power networks. The case studies presented in this talk will validate the proposed planning model and demonstrate that the proposed numerical solution can enhance the coordinated planning of large infrastructures with the proliferation of EVs.

Prof. Mohammad Shahidehpour

Distinguished Professor, Illinois Institute of Technology,
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Biography

Dr. Mohammad Shahidehpour is a University Distinguished Professor, Bodine Chair Professor of Electrical and Computer Engineering, and Director of the Robert W. Galvin Center for Electricity Innovation at Illinois Institute of Technology (IIT). His project on Perfect Power Systems has converted the entire IIT Campus to an islandable microgrid. Dr. Shahidehpour was the recipient of several technical awards including of the IEEE Burke Hayes Award for his research on hydrokinetics, IEEE/PES Outstanding Power Engineering Educator Award, IEEE/PES Ramakumar Family Renewable Energy Excellence Award, IEEE/PES Douglas M. Staszkesky Distribution Automation Award, and the Edison Electric Institute's Power Engineering Educator Award. He has co-authored 6 books and over 800 technical papers on electric power system operation and planning, and served as the founding Editor-in-Chief of the IEEE Transactions on Smart Grid. Dr. Shahidehpour is the recipient of the 2009 honorary doctorate from the Polytechnic University of Bucharest. He is a Fellow of IEEE, Fellow of the American Association for the Advancement of Science (AAAS), Fellow of the National Academy of Inventors (NAI), and an elected member of the US National Academy of Engineering (NAE). He is also listed as a highly cited researcher on the Web of Science (ranked in the top 1% by citations demonstrating significant influence among his peers).

