

# **TRUST-TECH: A Novel Paradigm for Nonlinear Optimization and its Application to Optimal Power Flow**

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Optimization technology has practical applications in almost every branch of science, business and engineering. Indeed, a large variety of the quantitative issues such as decision-making, design, operation, planning, and scheduling arising in science, engineering, and economics can be perceived and modeled as nonlinear optimization problems. From a practical viewpoint, there are strong motivations to develop effective methods for finding the global optimal solution. I and my research team members have developed a novel paradigm, termed Trust-Tech, for nonlinear optimization. Trust-Tech methodology has been applied to machine learning, optimal power flow, network partition, data clustering, signal processing, artificial neural network and was awarded three USA patents. In this talk, I will present an overview of Trust-Tech and its theoretical basis. The second part of this talk will be focused on practical applications of Trust-Tech to Optimal Power Flow. In addition, a new class of meta-heuristic-assisted Trust-Tech optimization methodology will be presented.

Brief Bio.: Dr. Hsiao-Dong Chiang (IEEE Fellow '97) received his PhD in EECS from University of California, Berkeley, USA. He has been Professor of ECE at Cornell University since 1998. His research effort is focused on nonlinear theory, nonlinear computation and applications to electric circuits, systems, signals and image. Dr. Chiang and his research team have published over 380 refereed papers and awarded 14 US patents and 4 oversea patents. His book, "Direct Methods for Power System Stability Analysis: Theoretica Foundations, BCU Methodology and Practical Applications" was published by Wiley and IEEE Press in 2010. His second book, "Stability Regions of Nonlinear Dynamical Systems: Theory, Estimation and Applications" was published by Cambridge Press in 2015. Dr. Chiang is founder of Bigwood Systems Inc. (1995), Ithaca, NY and founder of Global Optimal Technology Inc. (2000).