CE-CERT Seminar Series

2 p.m. Monday, July 12, 2010

Location: CE-CERT; Yeager Training Room

SOLAR FORECASTING AND OTHER UC ENERGY INITIATIVES

The California Institute for Computer and Information Technology Research in the Interest of Society (CITRIS). Headquartered on the campus of the University of California, Berkeley, the mission of the Center for Information Technology Research in the Interest of Society (CITRIS) is the creation and deployment of information technology solutions to complex societal problems. A unique public-private partnership, CITRIS is comprised of more than 300 faculty and thousands of students from myriad departments at four UC campuses (Berkeley, Davis, Merced and Santa Cruz) with industrial researchers from over 60 corporations. Together, this extensive team of researchers conduct research in areas of energy and the environment, intelligent infrastructure, healthcare and healthcare delivery, and technologies supporting developing economies. CITRIS represents a bold and exciting vision that is leveraging one of the top university systems in the world with highly successful corporate partners and government resources. Professor Wright will provide a brief overview of the structure and function of the CITRIS enterprise.

JEFF R. WRIGHT is Director of the University of California Institute Computer and Information Technology Research in the Interest of Society (CITRIS) for the Merced campus. Prior to that he served as the founding Dean of Engineering at the University of California, Merced (2001 - 2010). Before joining the faculty of the University of California he served on the faculty of the School of Civil Engineering Purdue University for the period of 20 years, including administrative responsibilities as Associate Dean for Research, and Director of the Indiana Water Resources Research Center. Professor Wright holds undergraduate degrees in Social Psychology and in Civil Engineering from the University of Washington, an MSE in Environmental Engineering also from the University of Washington, and a Ph.D. from The Johns Hopkins University through the Department of Geography and Environmental Engineering. His research focuses on multiobjective optimization modeling and spatial decision support systems.

Solar Forecasting Research at UC Merced

The Solar Forecasting Laboratory at the University of California Merced has collected over 15 months of high quality horizontal and direct normal irradiance measurements at different wavelengths (UV, IR and visible) with the primary objective of developing, calibrating and benchmarking novel and more accurate forecasting models for solar irradiance at the ground level. Without effective forecasting methodologies, neither solar nor wind power plants cannot be effectively connected to the power grid, which presents a major obstacle for high-penetration utilization of intermittent sources. Project leader Professor Carlos Coimbra will discuss different strategies for solar forecasting for both short- and long-term, high spatial and temporal resolution, and forecasting for different solar applications. In particular he will introduce a hybrid (GA/ANN) SSL (Stochastic, Self-Learning) methodology that yields very promising results for modeling and forecasting the solar resource, as well as some recent results of the application of our forecasting methodology to model the power output of UC Merced's 1 MW solar farm (SunPower 1-axis TPV).

CARLOS COIMBRA is Associate Professor of Mechanical Engineering at the University of California, Merced and serves as chair of the School's Mechanical Engineering and Applied Mechanics (MEAM) graduate group, and a member of the CITRIS faculty. His research focuses on variable order mechanics (VOM), solar energy, and unsteady multiphase flows. Professor Coimbra holds a Ph.D. from the University of California, Irvine (1998); an M.S. from the Instituto Superior Tecnico of Lisbon (1992), and undergraduate degrees from the University of Brasilia in Theoretical Physics (1990) and Mechanical Engineering (1989). He held previous faculty appointments at Drexel University and the University of Hawaii, Manoa. Professor Coimbra directs the CITRIS The Solar Irradiance Mapping Initiative SIMI; a proof-of-feasibility project that combines state-of-the-art satellite and radar data image processing with real-time data from ground solar stations in order to determine solar energy availability for the atmospheric conditions found in California. The web-based, near real-time information database generated by SIMI will provide a direct estimate of both current and prospective power availability for solar-based technologies in the state of California.