【清华信息大讲堂】第六十九讲

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Integrating Solar and Wind Power Generation for Electric Vehicles

Dec. 15, 14:30-17: 00   Room 1-315, FIT Building

Abstract:

We present the Monarch Power/Electric Vehicle (MPEV) that integrates solar and wind power generation for electric vehicles. The design of the MPEV is done to meet the needs of people with no access to power, fuel, hot water, or paved road, but have an abundance of solar and wind. We anticipate use of the MPEV by soldiers in the Middle East, the Navajo Indians in Arizona, the nomads in Africa and Arabia, or the vast hinterland of NW China.

New system concepts are introduced. First we use Concentrated Solar Power (CSP) and Concentrated Wind Power (CWP) that is integrated into the structure of the MPEV. Second, we introduce new energy management techniques with intelligent batteries that are exchangeable. Third, we create a telematics system based on the RFID, WiFi, Bluetooth, and 4G wireless for MPEV mechanical control and energy management. Fourth, we also design the MPEV to transport water that is used to cool high efficiency (38%) triple-junction GaAs solar cells that are 1000X solar focused, and in the process generates hot water for domestic consumption.

Dr Joseph Hui received his BS, MS, and PhD degrees from MIT in 1981, 1981, and 1983. Since graduation, he has worked at IBM and Bellcore, as well as taught at Columbia University, Rutgers University, the Chinese University of Hong Kong, and since 1999 holds the ISS Chair Professor of Electrical, Computer and Energy Engineering at Arizona State University.

At Rutgers and the Chinese University of Hong Kong, he performed research on multimedia and Internet communications, built video servers, commercialized Voice over IP, and assisted in the research and construction of the Hong Kong Internet Exchange. He was also appointed an adviser of the Hong Kong Government that ended the monopoly of Hong Kong Telecom for local and International phone service.

Since joining ASU, his research changed to wireless mesh networks, IO virtualization, cloud computing, and recently renewable energy generation, storage and usage. From his research, many companies were formed, including IXSoft and IXTech in the Hong Kong SAR, and in the US, 4Blox, and recently Nuon Labs and its subsidiaries Virtuon, Pcion, Etherion, and a recently acquired company ABM (Advanced Battery Management).

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