

Next Generation Energy Conversion Systems for Transportation and Renewable Applications

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ABSTRACT

Both public and private sector groups are calling for greater investment in more-electric transportation and renewable energy sources, with the growing concerns about energy security, environmental impact, and resource limitations. Key components in enabling greater adoption of these systems are high power density and energy-efficient power electronic units, distributed energy storage, and electric machine drives.

This presentation provides an overview of some of the research areas that have been pursued with the emphasis on power electronics architectures for drives and the utility interface with wide bandgap power devices. In addition, the presentation will focus on “plug and play” integration of renewables, distributed energy storage, and electric vehicles into utility grid and microgrids. Recent advancements in the state of the art will be presented along with practical implementations.



Yilmaz Sozer is a Professor in the Department of Electrical and Computer Engineering at the University of Akron. He is the co-director of the Center for Advanced Vehicles and Energy Systems at UA. He received his B.S. degree in electrical engineering from the Middle East Technical University Ankara, Turkey and his M.S. and Ph.D. degrees in electric power engineering from Rensselaer Polytechnic Institute Troy, NY. His masters and doctoral work focused on power electronics and the development of control algorithms for electric machines. Before joining the University of Akron, Dr. Sozer has worked at Advanced Energy Conversion Schenectady, NY. His research interests are in the areas of control and modeling of alternative energy systems, electric machine drives, transportation electrifications, high-power isolated DC/DC converter systems, static power conversion systems that interface energy storage and distributed generation sources with the electric utility. He has published over 300 journal and peer reviewed conference papers, 13 awarded and 8 pending patents. Dr. Sozer is the editor of IEEE Journal of Emerging and Selected Topics and he has served as an associate editor for IEEE Transactions on Power Electronics, IEEE Transactions on Transportation Electrification and paper review chair for the IEEE Transactions on Industry Applications. He is the past chair for the IEEE IAS Renewable and Sustainable Energy Conversion Systems Committee, and technical program chair for IEEE ECCE 2019, and IEEE IEMDC 2019.