UCF DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

Spring 2016 Seminar Series

DEVELOPMENTS IN PERMANENT MAGNET MACHINE HAVING CONCENTRATED WINDINGS

THURSDAY FEBRUARY 25, 2016

2:00 PM – ENG2 202

Traditionally wound permanent magnet (PM) motor employ full or fractional pitch winding coils each of which span and almost an entire pole of the machine. As a result, a relatively large amount of conductor must be used producing a corresponding large amount of conductor loss. More recently, attention has focused on machine in which each of the motor coils is simply wound around a single stator tooth forming a concentrated with very little wasted copper. The most notable development resulting from this technology is the Toyota Prius and Camry hybrid vehicle product line. However, one remaining issue with this type of machine is that of torque pulsations which occur because of the harmonics produced by the concentrated windings. Thus noise and vibration produced by the motor limits its widespread application. This presentation will discuss the problem and illustrate several innovative approaches to greatly reduce the severity of the problem.

DR. THOMAS LIPO

Florida State University

Thomas A. Lipo has spent his entire career in the technical field of solid state AC motor drives. He has BEE and MSEE degrees from Marquette University and a PhD from the University of Wisconsin. From 1969 to 1979, he was an Electrical Engineer in the Power Electronics Laboratory, Corporate Research and Development, General Electric Company, Schenectady NY where he participated in some of the earliest work in this field. In 1979 he left GE to take a position as Full Professor at Purdue University. In 1981, he joined the University of Wisconsin, Madison, where he co-founded the industry consortium WEMPEC and served for 28 years as its Co-Director and as the W. W. Grainger Professor for Power electronics and Electrical Machines. He also served simultaneously for 5 years (2009-2013) as World Class Professor at Hanyang University in Ansan, South Korea. He has held briefer positions at Sydney University, Sydney Australia, Cambridge University, Cambridge England, and Harbin Institute of Technology, Harbin China. He was a Fulbright Fellow at the Norwegian University of Science and Technology, Trondheim Norway in 2008. He is presently both an Emeritus Professor at the University of Wisconsin and Research Professor at Florida State University.

Dr. Lipo holds many distinguished achievements and awards, including Life Fellow of IEEE, Outstanding Achievement Award from the IEEE Industry Applications Society, the William E. Newell Award of the IEEE Power Electronics Society, and the Nicola Tesla IEEE Field Award from the IEEE Power Engineering Society. Dr. Lipo was elected a Fellow of the Royal Academy of Engineering(UK) and in 2008 a Member of the National Academy of Engineering(USA). In 2012 he was made a Charter Member of the National Academy of Inventors for his patents on AC machinery. In 2004 he was the recipient of the Hilldale Award in Physical Sciences from the University of Wisconsin, the most prestigious award given by the university for scientific research and has been the only Electrical Engineering Professor ever selected for this award in its over 40-year history. In 2014 he received the IEEE Medal in Power Engineering, the highest award presented by IEEE for research in the field of power engineering.