



### Tutorial Title:

Factors influencing active torque ripple cancellation in PMSM/IPMSM drives

### Organizer:

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### Abstract:

In this tutorial the main goal is to go in detail to understand various factors that needs to be considered to do an efficient active torque ripple cancellation for a PMSM/IPMSM drive at all operating condition. In this tutorial we will take a 12V 1-KWPMSM/IPMSM machine for the case study and analyze how different sensor error and non-linearities affect the torque ripple at different operating condition. The tutorial will also deal with how to develop high bandwidth current loop and also various challenges in regards to current control of PMSM drive with respect to doing effective torque ripple cancellation at all operating condition. Finally will conclude with various key factors that needs to be considered in selection of the motor position and current sensor in order to achieve effective active torque ripple cancellation for mass production

### Bio:

**Ramakrishnan Raja** (M'11) received B.Sc. degree from Amrita Institute of technology, India in 2003 and Master's Degree in electrical engineering from New Jersey Institute of Technology, in 2005. He received his Ph.D. degree in automotive system engineering from University of Michigan-Dearborn, MI. From 2004-2013 he has been working for Delphi steering and Nexteer automotive as Senior Electrical Engineer. Currently he is working at Halla mechatronics as Chief Scientist-Controls. Has been Associate professor in Saginaw Valley State University. He is responsible for motor drive /Vehicle Dynamics control for various automotive applications. His research interest includes electrical machines and variable speed drives including sensorless motor control drives. He is presently the Associate Editor for Industrial Drives Committee and Transportation System Committee.