Sarvajanik Education Society
Sarvajanik College of Engineering & Technology
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R&D Lecture Series (Electrical Department)

AY: 2018-2019

Title of the Talk:

Space-Vector based Pulse Width Modulation techniques to reduce Torque Ripple in Induction Motor Drives

Speaker Details

Dr. Pavan Kumar Hari received the B.Tech. Degree in 2005 from Acharya Nagarjuna University, Andhra Pradesh. He received the M.Sc.(Engg.) and the Ph.D. degrees from the Indian Institute of Science, Bangalore in 2008 and 2014, respectively.

He worked at the Low-voltage Drives Division of ABB Ltd., Bangalore during 2008–2009. He was a postdoctoral researcher in the School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, USA during 2015-2017. He has been working as an Assistant Professor in the Dept. of Energy Science and Engineering at IIT Bombay since May 2017.

His research interests include control and modulation methods for power electronic converters employed in AC motor drives and wind energy conversion systems.

Description of talk arranged on 07/09/2018

The talk was arranged to cover the wide range of audience to benefit UG and PG students as well as the faculties. Dr. Pavan Hari accordingly started his talk by giving an introduction on the requirement of PWM Techniques and the fundamentals of the PWM techniques.

The talk slowly advanced to cover the non-conventional space vector pulse width modulation techniques. Various SVPWM techniques on which Dr. Pavan Hari has worked were discussed and their relative merits and demerits over the conventional PWM and SVPWM techniques were highlighted. Following techniques were also covered in the presentation

1. Bus clamping modulation sequence

2. Advance Bus clamping modulation sequence

The application of these techniques for the control of induction motor was also covered. Dr. Pavan Hari explained in detail about the aspects of modelling of induction motor as well as about the vector control of induction motor. He also discussed the relative performance of the

conventional PWM technique & different space vector techniques in terms of their effect on the torque ripple and the THD. Dr. Finally he concluded with Hybrid PWM design which employed the conventional and advanced bus-clamping sequences appropriately to reduce the peak-to-peak torque ripple at high speeds of the drive. In addition Dr. Pavan Hari also answered the queries of the audience on the areas like modelling, design of the control schemes, other means of minimizing the losses or ripple etc.

The content was supported with simulation & hardware results that included the improvement in the nature of stator current, speed response and torque profile with all mentioned PWM techniques.

Research Collaboration

It was discussed with Dr. Pavan Hari about exploring of any opportunity whereby some collaborative work can be carried out. Dr. Pavan Hari has agreed to extend the support to the best of his capability.

Audience (Faculty /Students):

In addition to the faculties of the department of electrical engineering, students of PG (Electrical Engineering) as well as final year students from both the shifts actively participated in the guest talk.

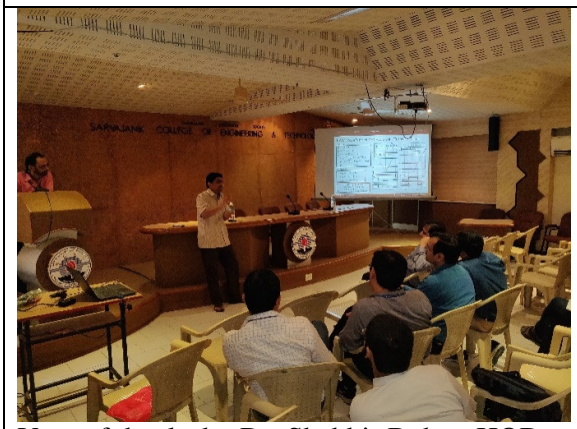
Some Snaps

Welcome speech by Dr. Shhabbir Bohra, HOD EED

Floral felicitation of the guest by Dr. Hardik Desai, HOD

Faculty and students attending the talk

Faculty and students attending the talk

 Dr. Pavan Hari discussing SVPWM techniques	 Dr. Pavan Hari responding to query
 Vote of thanks by Dr. Shabbir Bohra, HOD, EED	 Dr. H.H. Patel presenting memento to Dr. Pavan Hari

Acknowledgment (if any)