PRASHANT SURANA

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Objective: To excel in the field of Power Electronics, Electrical Machines and Renewable Energy Systems.

Education:

Year	Degree/ Examination	Discipline	Institute	CGPA
2020-2023	PhD	Multilevel Inverters, Induction Motor Drives	Indian Institute of Science, Bengaluru	9.0/10
2013-2015	M. Tech.	Power Electronics and Electrical Machine Drives	Indian Institute of Technology, Delhi	9.47/10
2008-2012	B. Tech.	Electrical and Electronics Engineering	National Institute of Technology, Tiruchirappalli	8.06/10
2007	12th	Physics, Chemistry, Mathematics	State Board	73.85%
2005	10th	-	State Board	86.17%

Research Experience at University of Southern Denmark, Denamrk (Assoc. Prof. Ramkrishan Maheshwari and Prof. Thomas Ebel):

- Design and development of 50kW DC-DC converter for electrolyser for green hydrogen generation in collaboration with Aalborg university and Danfoss Drives, Denmark.
- Development of resonant based gate drivers for parallel connected mosfets.
- Supervising Bachelor and Master students for projects on wide range input PFC converters, DTC of PMSM drive, multi-pulse AC-DC converters for electrolyser power supply and PMBLDC based slot-car racing.

Research Experience at Indian Institute of Science, Bengaluru (Prof. K. Gopakumar):

- Generation of a two-level 24-sided polygonal voltage space vector structure with real active vectors for open-end winding configuration Induction Motor.
- A Modulating Wave based Timing Calculation method is developed for a Multilevel 24-sided Polygonal Voltage Space Vector Structure with Similar Triangles.
- A Fault Tolerant Inverter Circuit is proposed to Generate Thirteen Level 24-sided Voltage Space Vector Structure for Open-end Winding Induction Motor Drive.
- A very dense 24-sided Voltage Space Vector Structure for Open-end Winding Induction Motor Drive is developed with 96-stepped waveform at maximum speed.

MTech Project at Indian Institute of Technology, Delhi (Late Prof. K Rajagopal):

- Design and Development of PMBLDC motor Drive.
- Hall sensor based and Back-EMF based position sensor-less techniques algorithms are implemented using Texas Instruments TIVA C series microcontroller. Practically implemented Mosfet Inverter, Opto-coupler circuit, voltage follower, Analog RC filter, Current sensor circuit and voltage sensor circuits.

BTech Project at National Institute of Technology, Tiruchchirappalli (Prof. N Kumaresan):

- Single Phase Operation of Three-Phase Induction Machine.
- A MATLAB program for predetermination of SMITH connected induction machine has been written and results were verified experimentally.

Work Experience:

1. **Power Electronics Engineer at Indian Space Research Organization, Bengaluru, India.** (March 2017-September 2020)

- Design, Development and Testing of core power systems, DC-DC converters, and distribution systems for mainframe and payloads.

2. **Associate Member of Technical Staff at Maxim Integrated, Bangalore. (**Oct 2016-March 2017)

- Aided in new product definition of Buck ICs for industrial power applications. Control loop and compensation design using bode analysis. DC-DC converter modeling and simulation using SIMETRIX SIMPLIS. Components selection for customer specific requirements and Providing application support for customers.

3. **Software Engineer at Infineon Technologies, Bangalore.** (July 2015-Sept 2016)

- Developed motor control software in C programming on ARM M0 & M4 series microcontrollers for PMBLDC (With & without Hall sensors) in a multinational team which includes people from India, Singapore, and Germany.

Journal Publications:

T1. **Surana, Prashant**, K. Gopakumar, L. Umanand, K. Rajashekara and L. G. Franquelo, "A Variable Speed Induction Motor Drive With 24-Stepped Voltage Waveform Throughout Modulation Range," in *IEEE Transactions on Industrial Electronics* (Early Access, IF = 7.7).

T2. **Surana, Prashant**, Mriganka ghosh Manjumder, Rakesh Resalayyan, Mohammed Imthias, K. Gopakumar, Umanand Loganathan, and Dariusz Zielinski. Modulating wave-based timing calculation for a multilevel 24-sided polygonal voltage space vector structure with similar triangles. *IEEE Journal of Emerging and Selected Topics in Industrial Electronics*, vol. 4, no. 1, pp. 219-227, Jan. 2023.

T3. **Surana, Prashant,** Mriganka Ghosh Majumder, Rakesh Resalayyan, K. Gopakumar, Loganathan Umanand, and Dariusz Zielinski. A fault tolerant inverter circuit to generate thirteen level 24-sided voltage space vector structure for open-end winding induction motor drive. *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 10, no. 6, pp. 7539-7548, Dec. 2022. (IF = 5.5)

T4. **Surana, Prashant**, Mriganka Ghosh Majumder, Rakesh Resalayyan, K. Gopakumar, Loganathan Umanand, and Wojciech Jarzyna. A fault-tolerant 24-sided voltage space vector structure for open-end winding induction motor drive. *IEEE Transactions on Power Electronics*, volume 37, pages 10738–10746, 2022. (IF = 6.7)

Conference Publications:

C1. Helong Li, Ramkrishan Maheshwari, Langlang Yu, **Prashant Surana**, Thomas Ebel “Resonant Gate Drive Circuit for Parallel Connected MOSFETs”. (Accepted in EPE 2023).

C2. **Surana, Prashant**, M. G. Majumder, K. Gopakumar, L. Umanand and P. N. Tekwani, "A Hybrid Polygonal Space Vector Modulation Scheme for an Induction Motor Drive," 2022 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Jaipur, India, 2022, pp. 1-6.

C3. **Surana, Prashant,** Mriganka Ghosh Majumder, K. Gopakumar, Loganathan Umanand, and Leopoldo Garcia Franquelo. “A Dense Multilevel 24-sided Polygonal Voltage Space Vector Structure for IM Drive with Open-end Winding Configuration” In IECON 2022 – 48th Annual Conference of the IEEE Industrial Electronics Society, accepted for presentation.

C4. **Surana, Prashant,** Rakesh R, K. Gopakumar, and Loganathan Umanand. A 24-sided polygonal voltage space vector structure for IM drive with open end winding configuration. In IECON 2021 – 47th Annual Conference of the IEEE Industrial Electronics Society, pages 1–5, 2021.

C5. **P. Surana**, Sreejith R. and K. R. Rajagopal, "A low-cost position sensorless brushless DC motor drive," 2016 IEEE International Conference on Power Electronics, Drives and Energy Systems (PEDES), Trivandrum, 2016, pp. 1-5.
