



Basaveshwar Engineering College (Autonomous)

[AICTE Recognized, TEQIP-I, II & III, Permanently Affiliated to VTU Belagavi, NBA & NAAC Accredited]

Bagalkot-587103, Karnataka state, India

Department of Electrical & Electronics Engineering

[Govt. Aided, Accredited by NBA 2003, 2006, 2018, Recognized R&D centre of VTU]

Smart control of Power Electronics based Machine Drives Research Laboratory

List of Major Equipments

Sl.	Details of Equipments	Year of Purchase	Amount (Rs.)
1.	DC Motor with Mechanical Load 1.0 kW, 320V, 1500 rpm, Motor type with 1024 ppr. Incremental Encoder connected externally for speed feedback and mechanical loading arrangement (Brake Drum) along with required power supply for sensors, shielded cables for motor terminals.	2016	2,00,000
2.	FPGA based WAVECT Controller 4 Voltage and 4 current sensors capable of sensing upto 1000 V and 25 A respectively with FPGA processor, generates 16 number of PWM pulses, ADC to convert varying analog signals into digital signal, senses speed from motor and converts it into RPM, captures the instantaneous voltage and current waveform.	2016	50,000
3.	Two Level Inverter, Class E Chopper It consists of 3 Phase IGBT based Inverter + Rectifier + Class E Chopper connected with DC Motor to supply required controlled power supply.	2016	50,000
4.	Induction Motor with Mechanical Load 1.5 kW, 2.0 hp, 1420 rpm, 415 V, 50 Hz three phase motor type with 1024 ppr. Incremental Encoder connected externally for speed feedback and mechanical loading arrangement (Brake Drum) along with required power supply for sensors, shielded cables for motor terminals.	2016	10,00,000
5.	Three Level Neutral Point Clamped Inverter Bridge rectifier with capacity of V_{in} 415 V ac and V_{out} upto 600 V dc with 4 phase IGBT inverter having 10 KHz switching frequency.	2016	2,10,000
6.	Switched Reluctance Motor Drive with Mechanical Load 2.2 kW, 3-HP, 320V, 3000 rpm, 8/6 with 1024 ppr. Incremental Encoder connected externally for speed feedback and mechanical loading arrangement (Brake Drum) along with required power supply for sensors, shielded cables for motor terminals.	2018	4,00,000
7.	3 Phase Diode Bridge Rectifier with 4 Phase SRM Inverter Bridge rectifier with V_{in} 415 Vac and V_{out} upto 560 Vdc with 4 phase IGBT inverter having 10 KHz switching frequency.	2018	1,00,000



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Number of UG Projects and Details:

Academic Year 2017-18

- FPGA based Implementation of SPWM and SVPWM for Two Level Inverter

Academic Year 2020-21

- Development of Hysteresis based Speed Control for Switched Reluctance Motor
- Implementation of FPGA based DC Drives Employed in Industrial Application

Academic Year 2020-22

- FPGA based Implementation of Symmetrical Switching Space Vector Pulse Width Modulation for Two Level Voltage Source Inverter
- Implementation of Phase Disposition Pulse Width Modulation Technique for 5 Level Cascaded H-Bridge Inverter using FPGA-Xilinx



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Number of PG Projects and Details:

Academic Year 2015-16

- Design and Simulation of Direct Instantaneous Torque Control for Minimization of Torque Ripple in Switched Reluctance Motor Employed in Electric Vehicular Application

Academic Year 2016-17

- Design and Implementation of FPGA based Closed Loop V/F Speed Control of Induction Motor Employed for Industrial Application

Academic Year 2017-18

- Implementation of Symmetrical Switching in Space Vector PWM for Three Level Neutral Clamped Converter using FPGA

Academic Year 2018-19

- FPGA Based Implementation of Speed Control for SRM Drive using PI Controller



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Number of Registered Ph.D. Candidates

1. Basavaraju S. Hadapad

Investigation of Torque Ripple Minimization Techniques in SRM Drive for EV application
– 2019

(DoReg: 01.07.2019 USN 2BA19PEE03)



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Number of Publications and Details:

Technical Papers published in International Journals:

1. Basavaraju S. Hadapad and Raghuram L. Naik, "A simple approach for the computation of magnetic characteristics of 4-phase switched reluctance motor", International Journal of Power Electronics and Drive Systems (IJPEDS), Vol. 15, No. 1, March 2024, pp. 136-146.
2. Hadapad Basavaraju, Naik R L, "FPGA Implementation for Speed Controlling of 8/6 Switched Reluctance Motor Using PI Controller", International Journal of Innovative Technology and Exploring Engineering, Vol-9, issue-2 pp 1286-1291, Dec- 2019 (Q-4)
3. Asma., Naik R L, Jangamshetti S. H., "Implementation of Space Vector Pulse Width Modulation using Arduino", International Journal of Scientific and Research Publication, Vol.3, Issue 7, July 2014.
4. Naik R.L., Jangamshetti S.H., "Modified Space Vector Switching for Three Level NPC Converter Based Unity Power Factor Conditioner in Grid Connected WECS", International Journal of Scientific & Engineering Research, Vol-4, Issue-4, April 2013, pp 2013- 2021.
5. Naik. R. L., Jangamshetti. S. H., Udyakumar. R. Y "Multilevel Inverter for Photovoltaic Power Supply System" International Journal on Electronic and Electrical Engineering (IJEET), Vol. 05, No. 07, June 09 – Aug 09, pp 42-51.

Technical Papers published in International Conferences:

1. Basavaraju S. Hadapad and Raghuram L. Naik, "Implementation of FPGA Based Controller for DC Drives Employed in Industrial Applications", 2025 IEEE North Karnataka Subsection Flagship International Conference (NKCon), 27-28 September 2025, KLE Institute of Technology, Gokul, Hubballi, India.
2. Basavaraju S. Hadapad and Raghuram L. Naik, "Development of PD-PWM Technique for 5-Level Cascaded H-Bridge Inverter using FPGA for SPV Systems", 1st International Conference on Sustainable Solutions in Engineering and Technology, August 29th and 30th, 2024, BEC, Bagalkote, India.
3. B. S. Hadapad and R. L. Naik, "An Investigation on Torque Control Strategies for Switched Reluctance Motor," 2021 5th International Conference on Electrical, Electronics, Communication, Computer Technologies and Optimization Techniques (ICEECOT), 2021, pp. 161-167.
4. Hadapad Basavaraju, Naik R. L., "FPGA Implementation for Speed Controlling of 8/6 Switched Reluctance Motor using PI Controller", ISSN: 2278-3075, Vol.9, Issue-2, pp.1286-1291, December 2019.
5. R. L. Naik and K. B. Hunasikatti, "FPGA Based Implementation of Symmetrical Switching in SVPWM for Three Level NPC Converter," 2019 Third International Conference on Inventive Systems and Control (ICISC), Coimbatore, India, 2019, pp. 592-597.
6. K. B. Hunasikatti, R. L. Naik and V. D. Nayak, "Critical Review of Control Strategies for Switched Reluctance Motor Employed in Electric Vehicle," 2018 Second International



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Conference on Advances in Electronics, Computers and Communications (ICAECC), Bangalore, 2018, pp. 1-6.

7. K. B. Hunasikatti, R. L. Naik and B. V. Hiremath, "Implementation of FPGA Based Closed Loop V/f Speed Control of Induction Motor Employed for Industrial Applications," 2018 Second International Conference on Advances in Electronics, Computers and Communications (ICAECC), Bangalore, 2018, pp. 1-6.
8. Nayak D. Veena, Naik. L. Raghuram, "Minimization of Torque Ripple using DITC with Optimum Bandwidth and Switching Frequency for SRM Employed in Electric Vehicle", International Conference on Smart grids, Power and Advanced Control Engineering (ICSPACE), pp.143 – 148, 2017.
9. Santhram.Rai.C, Udaykumar.R.Y, Raghuram.L.Naik, "A Novel Technique For Photovoltaic Maximum Power Point Tracking System" Proceedings of 11th European Conference On Power Electronics and Application (EPE 2005), Dresden Germany , Jan 2005 , pp.1-8.

Technical Activities:

Internship for the students of REC, Bijnor, Uttara Pradesh

