# Sanjay Tolani

| | | |
|---|---|---|
| <small>CONTACT INFORMATION</small> | Assistant Professor,<br>Department of Electrical Engineering,<br>S V National Institute of Technology, Surat. | Phone: 9005510586<br>sanjay.tolani74@gmail.com |

<small>OBJECTIVE</small>   To contribute in the field of Power Electronics, Renewable Energy and Electric Drives.

<small>EDUCATION</small>

**Indian Institute of Technology Kanpur**, Kanpur.

Ph.D., Power Electronics, April 2019.
- Advisor: Prof. Parthasarathi Sensarma
- CPI: 8/10

**Indian Institute of Technology (BHU) Varanasi**, Varanasi.

M.Tech., Electrical Machines and Drives, May 2010.
- Advisor: Prof. R K Srivastava
- CPI: 8.4/10

**Government Engineering College Bikaner**, Bikaner.

B.E., Electrical Engineering, May 2008.
- Percentage: 69.1/100

<small>RESEARCH INTERNSHIP</small>

**Warwick University**, Coventry, UK. (March 2017)

<small>RESEARCH</small>

**Voltage Regulation and Current Sharing Control in Modular AC Power Supplies with Reduced Sensor Count**- Doctoral Thesis, IIT Kanpur.
- Voltage-source inverter (VSI) with an output LC-filter forms the final conversion stage in many applications like uninterruptible power supply (UPS), renewable energy based stand-alone power supply system and solid-state transformer topologies. A high quality output voltage at nominal frequency and magnitude is demanded in these applications. Modular arrangement of VSI units in parallel increases system capacity and redundancy, but an effective current sharing scheme is required to mitigate the circulating currents among the paralleled units. This thesis developed effective control techniques for modular VSI systems using minimal sensor count to increase system reliability without incurring extra control cost.
- Two voltage regulation schemes are proposed for a 3-phase VSI and validated experimentally through a 7.5 kW laboratory prototype.
- An instantaneous current sharing scheme is proposed for multi-modular VSI system and validated through experimental results with a 22.5-kW system supported by three parallel connected VSI modules.
- Control algorithms are realized through 32-bit fixed point digital signal processor (TMS320F2812).

**Bidirectional power flow control in a three-phase back-to-back (B2B) converter**- as a part of the collaboration in a joint UK-India research project on Reconfigurable Distribution Networks (March, 2017).

PUBLICATIONS    **IEEE Transactions**

1. **S. Tolani**, S. Joshi and P. Sensarma, "Dual Loop Digital Control of Three-Phase Power Supply Unit with Reduced Sensor Count," *IEEE Transactions on Industry Applications*, vol. 01, Jan.2018.

2. **S. Tolani** and P. Sensarma, "An Instantaneous Average Current Sharing Scheme for Parallel UPS Modules," *IEEE Transactions on Industrial Electronics*, vol.64, Dec.2017.

3. **S. Tolani** and P. Sensarma, "Extended Bandwidth Instantaneous Current Sharing Scheme for Parallel UPS Systems," *IEEE Transactions on Power Electronics*, vol. 32, June 2017.

**IEEE Conferences**

1. **S. Tolani**, V.Gautam and P. Sensarma, "Improved selective frequency active damping for voltage source inverter with output LC filter," *IEEE PEDES* 2018, IIT Madras.

2. V.Gautam, **S. Tolani** and P. Sensarma, "Design and comparison of enhanced voltage gain active clamped flyback," *IEEE PEDES* 2018, IIT Madras. Converters

3. **S. Tolani**, S. Joshi and P. Sensarma, "Dual loop digital control of UPS inverter with reduced sensor count," *IEEE PEDES* 2016, Trivandrum.

4. S. Joshi, **S. Tolani** and P. Sensarma, "Design of an analog sliding mode controlled audio amplifier," *IEEE PEDES* 2016, Trivandrum.

5. **S. Tolani** and P. Sensarma, "Output impedance mitigation at filter resonance for single and three-phase UPS systems with reduced sensor count," *IEEE IECON*, 2015, Yokohama, Japan.

6. **S. Tolani**, T. S. Sasmal and P. Sensarma, "Low-cost digital realization of phase synchronization for grid tied micro inverter," *IEEE ECCE* 2015, Montreal, QC.

7. **S. Tolani** and P. Sensarma, "An improved droop controller for parallel operation of single-phase inverters using R-C output impedance," *IEEE PEDES* 2012, Bengaluru.

HARDWARE
SKILLS
- Analog circuit design for conditioning of current and voltage sensors outputs, and implementation of system's protection logics.
- Hands-on experience with PCB assembly & soldering of through-hole and SMD components.

SOFTWARE
SKILLS
| | |
|---|---|
| PCB Design Tools | : Altium DXP |
| Firmware coding | : Machine level language coding for DSP |
| Simulation Softwares | : MATLAB Simulink, PLECS |
| Publishing Packages | : Microsoft Office, LATEX |

PROFESSIONAL
EXPERIENCE

**Indian Institute of Technology Kanpur**

- Senior Student Research Associate
  (June 2016-June 2017 and Aug 2017-Oct 2017)

  Worked in an India- UK Collaborative Research Project: Reconfigurable distribution networks.

- Tutor for the following laboratory courses (July 2011 to May 2016)

  Digital Control Systems.
  Power Electronics.

REFERENCES

Prof Parthasarathi Sensarma
Electrical Engineering Department          Phone: 0512-259-7076
IIT Kanpur, India                          E-mail: sensarma@iitk.ac.in

Prof Santanu Mishra
Electrical Engineering Department          Phone: 0512-259-6249
IIT Kanpur, India                          E-mail: santanum@iitk.ac.in

Prof R.K. Srivastava
Electrical Engineering Department          Phone: 0542-2575279
IIT (BHU) Varanasi, India                  E-mail: rksrivastava.eee@itbhu.ac.in