

Pushkar Prakash Arya

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ACADEMIC DETAILS

- **Ph.D.** in *System and Control* in the **Department of Electrical Engineering, Indian Institute of Technology (IIT) Roorkee**, Uttarakhand
 - July 2015 to Dec 2020
- Master in Technology (**M. Tech.**) was in *Control and Industrial Automation* in the **Department of Electrical Engineering, National Institute of Technology (NIT) Silchar**, Assam.
 - June 2013 to May 2015
- Bachelor in Engineering (**B.E.**) was in the *Department of Electrical and Electronics Engineering*, Dayananda Sagar College of Engineering, (**DSCE**) **Bangalore**.
 - June 2008 to May 2012

RESEARCH INTEREST

- Multi-Agent Systems
- Fractional Order Control
- Linear Control Theory
- Process Control
- Robust Control

RESEARCH EXPERIENCE

IIT Roorkee

Thesis: Advanced Internal Model Controller Design for Time Delayed Processes

Specialization: System and Control (in Dept. of Electrical Engineering)

Supervisor: Dr. Sohom Chakrabarty

Role: PhD Candidate

NIT Silchar

Thesis: Design of Controllers of FO-PID Family for Integer Order (IO) as well as FO Plants

Specialization: Control and Industrial Automation (in Dept. of Electrical Engineering)

Supervisor: Dr. Prashanta Roy

Role: Master's Researcher

TEACHING EXPERIENCE

- 6th Nov 2021 to present:
 - Assistant Professor in the Dept. of Electrical & Electronics Engineering, Siddaganga Institute of Technology (Autonomous, affiliated to VTU), Tumkur, Karnataka.
 - *Subjects taught/teaching:*
 - Electrical Power Utilization (UG 2nd year)
 - Basic Electrical (UG 1st year)
- August 2020 to Oct 2021:
 - Assistant Professor in the Dept. of Electrical Engineering, G H Raisoni Institute of Engineering and Technology (affiliated to SPPU), Pune, Maharashtra.
 - *Subject taught:*
 - Control System-I (UG 3rd year)
 - Control System-II (UG 4th year)
 - Digital Control Systems (UG 4th year)
 - Electrical Circuit Analysis (UG 2nd year)

TEACHING ASSISTANTSHIP

- IIT Roorkee
 - Served as Teaching Assistant (TA) for Master and PhD level course entitled: Sliding Model Control, Advanced control systems, Modelling and Simulation.
 - Served as TA for UG level course: Microprocessor, Analog Electronics, Digital Electronics, linear Control Systems, Electrical measurement, Electronic Measurement.
- NIT Silchar
 - Served as TA for UG level course: Control Systems.

PUBLICATIONS

Journals

- **P. P. Arya**, and S. Chakrabarty, "A robust internal model controller with increased closed loop bandwidth for process control systems", *IET Control Theory & Applications*, vol. 14, no. 12, pp. 2134–2146, 2020. <https://ietresearch.onlinelibrary.wiley.com/doi/10.1049/iet-cta.2019.1182>
- **P. P. Arya** and S. Chakrabarty, "A Robust Internal Model-Based Fractional Order Controller for Fractional Order Plus Time Delay Processes," *IEEE Control Systems Letters*, vol. 4, no. 4, pp. 862-867, Oct. 2020. <https://ieeexplore.ieee.org/abstract/document/9094243>
- **P. P. Arya** and S. Chakrabarty, "IMC based Fractional Order Controller Design for Specific Non-Minimum Phase Systems", *IFAC-PapersOnline, Elsevier*, vol. 51(4), pp. 847-852, 2018. <https://www.sciencedirect.com/science/article/pii/S2405896318304208>
- **P. P. Arya** and S. Chakrabarty, "A Modified IMC Structure to Independently Select Phase Margin and Gain Cross-over Frequency Criteria", *IFAC-PapersOnline, Elsevier*, vol. 51(1), pp. 267-272, 2018. <https://www.sciencedirect.com/science/article/pii/S2405896318302271>

Book Chapters

- V. Gupta, **P. P. Arya**, and S. Chakrabarty, "Modelling and PID control of two-wheel mobile robot with a manipulator and its implementation in SIMULINK", *Advances in System Engineering*, 2021. https://link.springer.com/chapter/10.1007/978-981-15-8025-3_58

Conferences

- **P. P. Arya** and S. Chakrabarty, "Root mean square based identification of FOPTD models from step response data," *IECON 2020 The 46th Annual Conference of the IEEE Industrial Electronics Society*, pp. 356-360, 2020. <https://ieeexplore.ieee.org/abstract/document/9254594>
- **P. P. Arya** and S. Chakrabarty, "Improved Disturbance Rejection using TDF-IMC for DC-DC Boost Converters", *16th IEEE India Council International Conference (INDICON) 2019*. <https://ieeexplore.ieee.org/abstract/document/9029065>
- **P. P. Arya** and S. Chakrabarty, "Reduced order controller for FO-IMC with desired phase margin and gain cross-over frequency", *IEEE Bombay Section Signature Conference (IBSSC) 2019*. <https://ieeexplore.ieee.org/abstract/document/8973036>
- S. Saxena, Y. V. Hote, and **P. P. Arya**, "Reduced-order modeling of commensurate fractional-order systems", *14th International Conference on Control, Automation, Robotics and Vision (ICARCV) 2016*. <https://ieeexplore.ieee.org/abstract/document/7838855>

Preprints

- **P. P. Arya** and S. Chakrabarty, "Model based fractional order controller design for process plants satisfying desired robustness criteria", arXiv preprint arXiv:2002.07476, 2020. <https://arxiv.org/abs/2002.07476>

TECHNICAL WORKSHOP AND SEMINAR ATTENDED

- March 2021, Five days FDP on *Nonlinear Systems: Modelling and Control*.
 - Experts: Prof. Emilia Fridman (Tel-Aviv Univ., Israel); Prof. J. A. Moreno (UNAM Mexico); Prf. J. Sarangapani (Missouri Univ. of S&T USA); Prof. Antonella Ferrara (Univ. of Pavia, Italy) Prof. Debasattam Pal, Prof. R. Banavar, Prof. S. C. Patwardhan, Prof. Arpita Sinha (IIT Bombay); Dr. Shyam Kamal (IIT BHU); Prof. S. R. Sahoo (IIT Kanpur); Dr. Atreyee Kundu (IISC Bangalroe); Dr. Rajeeb Dey (NIT Silchar)
 - Organizer: ATAL, NIT Silchar
- October 2020, Six days workshop on *Homogeneity Based Design of Sliding Mode Controllers*.
 - Experts: Prof. Leonid Fridman (UNAM Mexico), Jaime Alberto Moreno Perez (UNAM Mexico), and Bijan Bandyopadhyay (IIT Bombay).
 - Organizer: EECI-IGCS
- MAY 2019, One week faculty development programme on *Deep Learning and Applications*.
 - Experts: Dr. Sanjeev Manhas, Dr. Partha Pratim Roy (IIT Roorkee), and Dr. Balasubramanian Raman (IIT Roorkee)
 - E&ICT Academy, IIT Roorkee
- NOV 2018, Four days course on *Sliding Mode Control in Infinite-Dimensional Setting: Theory Extension and Applications*.
 - Expert: Prof. Yury Orlov (CICESE, Mexico) and Dr. S. Chakrabarty (IIT Roorkee)
 - Organizer: GIAN, IIT Roorkee
- MAY 2018, One week faculty development program on *Electric Vehicle*.
 - Organizer: E&ICT Academy, IIT Roorkee
- JAN 2018, Two day guest lecture on *A Perspective of the Field of Control of Dynamic Systems and Identification of Continuous-Time Systems*.
 - Expert: Prof. Ganti Prasada Rao (Member, UNESCO-EOLSS Joint Committee).
 - Organizer: Department of Electrical Engineering, IIT Roorkee
- DEC 2017, Ten days course on *Robustness, Fragility, Optimality & Modern PID Control*.
 - Expert: Prof. S. P. Bhattacharya (Texas A&M Univ.).
 - Organizer: GIAN, NIT Silchar
- OCT 2017, Four days course on *Advanced Sliding Model Control and Estimation for Real Complex Systems of the 21st Century*.
 - Expert: Prof. Sarah K. Surgeon (UCL, London).
 - Organizer: GIAN, IIT Roorkee

- MARCH 2017, One week course on *Cyber Physical Systems*.
 - Organizer: Dept. of Electrical Engineering, IIT Kanpur
- FEB 2017, Five days course on *Advanced Control Techniques in Electrical and Electronics Engineering*.
 - Organizer: EED, IIT Roorkee
- SEPT 2014, Two days' workshop on *Implementation of Image Processing using LabVIEW*.
 - Organizer: National Instruments, EED, NIT Silchar
- JUNE 2014, Two days' workshop on *Data Acquisition with LabVIEW and NI hardware*.
 - Organizer: National Instruments, EED, NIT Silchar
- SEPT 2013, Two days' workshop on *MEMS and Sensors*.
 - Organizer: IEEE-EDS, NIT Silchar

PROFESSIONAL MEMBERSHIP

- IEEE Young Professionals
- IEEE Student Member
- IEEE Control Systems Society (IEEE-CSS)

REVIEWER

- ISA Transactions
- IEEE Transactions on Control System Technology
- Journal of Franklin Institute
- International Journal of Control
- Asian Journal of Control
- International Journal of Systems Science
- Transactions on Institute of Measurement and Control
- IEEE Conference on Decision and Control (CDC)
- American Control Conference
- IFAC conference, etc.

VOLUNTEER

- *"Sliding Mode Control in Infinite-Dimensional Setting: Theory Extension and Applications"*, 7-11 Nov 2018, sponsored by Global Initiative for Academic Networks (GIAN) Phase-II.
- *"Advanced Sliding Mode Control and Estimation for Real Complex Systems of the 21st Century"*, 23-27 Dec-2017, sponsored by Global Initiative for Academic Networks (GIAN) Phase-II.
- *"Modern Techniques in Nonlinear Robust Control"*, 7-10 August 2017, sponsored by Continuing Education Centre (CEC), IIT Roorkee, India.
- International Conference on *"Soft Computing for Problem Solving 2014"*, organized at NIT Silchar, Assam, India.

HONOURS, AWARDS AND ACHIEVEMENTS

- Received *IEEE CSS Student Travel Support Program* award for IEEE Conference on Decision and Control (CDC) 2020, held between 14th to 18th Dec 2020 at Jeju Island, Republic of Korea.
- July 2015-June 2020: *Doctoral fellowship from Ministry of Human Resource and Development (MHRD)*, Government of India.
- August 2013-May 2015: *Post Graduate fellowship from Ministry of Human Resource and Development (MHRD)*, Government of India.
- Qualified Graduate Aptitude Test in Engineering (GATE) in Electrical Engineering in years 2013, 2014 and 2015.

EXTRA CURRICULAR ACTIVITIES

- Was an *active member of Belda Village Activity* group since mid-2017 to early-2019 in IIT Roorkee. The aim of the group was to improve technical, interpersonal and overall skill development of under-privileged children in the village Belda, near Roorkee.
- Secured second position in Carom organized under *Inter-Bhawan Games 2019-20*, at IIT Roorkee.
- Secured second position in Chess organized under *Intra Bhawan Games 2019-20*, Azad Bhawan, at IIT Roorkee.
- Secured second position in Carom-Doubles in *Intra Bhawan Games 2019-20*, Azad Bhawan, IIT Roorkee.
- Had been one of the team member of winning Cricket-team in *Intra Bhawan Cricket Tournament 2018-19*, Azad Bhawan, IIT Roorkee.
- Was captain of a cricket team in *Intra Bhawan Cricket Tournament 2019-20*, Azad Bhawan, IIT Roorkee.

COMPUTER SKILLS

- Languages and Software: MATLAB & SIMULINK, MS Office, LATEX, Maplesoft, C, python.
- Operating Systems: Windows, UNIX.

REFERENCES

- *Dr. Sohom Chakrabarty*
(*Ph.D. supervisor*)
Assistant Professor,
Department of Electrical Engineering,
IIT Roorkee, Uttarakhand, India.
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- *Prof. Binoy Krishna Roy*
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- *Prof. Suraj P. Harsha*
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