

Curriculum Vitae

Personal Details:

Name : Ujjwal Manikya Nath
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Email : um.nath@yahoo.com
Date of Birth : 29/03/1989
Gender : Male
Nationality : Indian

Academic Qualifications:

Name of Examination	Board/University	Subjects/Specialization	Year of Passing
Secondary	West Bengal Board of Secondary Education	English, Bengali, Mathematics, Physical Science, Life Science, History, Geography	2004
Higher Secondary	West Bengal Council of Higher Secondary Education	English, Bengali, Mathematics, Physics, Chemistry	2006
B.Tech.	West Bengal University of Technology	Electronics and Instrumentation Engineering	2010
M.Tech.	University of Calcutta	Instrumentation and Control Engineering	2015
Ph.D.	Jadavpur University	Instrumentation and Electronics Engineering (Specialization: Control System)	2020

Thesis title:

Design and Performance Study on Model-based Process Control Systems

GATE: GATE-2013- Instrumentation Engineering (IN)

Teaching Experiences:

Organization	Department	Designation	Duration
Jorhat Engineering College, Jorhat, Assam	Instrumentation Engineering	Assistant Professor (Contractual)	10/02/2022 – present
Jorhat Engineering College, Jorhat, Assam	Instrumentation Engineering	Assistant Professor (TEQIP, NPIU)	3 years (04/09/2018 – 30/09/2021)
Jadavpur University	Power Engineering	Guest Faculty	6 months (02/02/2018 – 30/07/2018)

Research Experiences:

Organization	Department	Designation	Duration
Jadavpur University	Instrumentation and Electronics Engineering	Junior Research Fellow (JRF)	2 years (01/02/2016- 31/01/2018)
IIT Kharagpur	Electronics and Electrical Communication Engg.	Junior Project Assistant (JPA)	1 year (24/02/2011- 23/02/2012)

Project:

PIs	Title	Funding agency	Amount (INR)	Status
U. M. Nath (PI), S. Biswas, R. K. Mudi, and C. Dey	Earlier detection of cardiac irregularity based on human blood pressure model	TEQIP III, NPIU, Ministry of Education, Government of India	1537675/-	Completed (30/06/2021)

Publications:

Journals:

- [1] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘Desired characteristics equation based PID controller tuning for lag-dominating processes with real-time realization on level control system,’ *IEEE Control Systems Letters*, ISSN: 2475-1456, vol. 5, no. 4, pp. 1255-1260, (DOI: 10.1109/LCSYS.2020.3030173), 2021.

- [2] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Review on IMC based PID controller design approach with experimental validations,' *IETE Journal of Research*, ISSN: 0377-2063, (DOI: 10.1080/03772063.2021.1874839), 2021.
- [3] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Mathematical modelling and fuzzy knowledge based decoupled control scheme for real-time interacting level control- MIMO system,' *International Journal of Modelling and Simulation* (Taylor and Francis), ISSN: 0228-6203, 1925-7082, (DOI: 10.1080/02286203.2022.2051992), 2022.
- [4] **U. M. Nath**, C. Dey, and R. K. Mudi, 'IMC based anti-windup controller for real-time hot air flow and level control loop,' *International Journal of Automation and Control* (Inderscience), ISSN: 1740-7524, vol. 16, no. 2, pp. 205-218, (DOI: 10.1504/IJAAC.2022.10044252), 2022.
- [5] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Fuzzy tuned model based control for level and temperature processes,' *Microsystem Technologies*, ISSN: 0946-7076, vol. 25, no. 3, pp. 819-827, (DOI: 10.1007/s00542-019-04300-x), 2019.
- [6] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Designing of internal model control proportional, integral, and derivative controller with second-order filtering for lag- and delay-dominating processes based on suitable dead time approximation,' *Asia Pacific Journal of Chemical Engineering*, ISSN: 1932-2143, vol. 14, no. 6, pp. e2359, (DOI: 10.1002/apj.2359), 2019.
- [7] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Stabilized IMC-PI controller designing for IPDT processes based on gain and phase margin criteria,' *IFAC-PapersOnLine*, ISSN: 2405-8963, vol. 53, no. 1, pp. 129-134, (DOI: 10.1016/j.ifacol.2020.06.022), 2020.
- [8] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Fuzzy rule-based auto-tuned internal model controller for real-time experimentation on temperature and level processes,' *International Journal of Automation and Control*, ISSN: 1740-7516, vol. 14, no. 2, pp. 239-256, (DOI: 10.1504/IJAAC.2020.105521), 2020.
- [9] **U. M. Nath**, C. Dey, and R. K. Mudi, 'A switching IMC-PID controller design for lag dominating processes with real-time validation,' *Mechatronic Systems and Control*, ISSN: 1480-1752, vol. 48, no. 3, pp. 171-182, (DOI: 10.2316/J.2020.201-0064), 2020.
- [10] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Designing of IMC-PID controller for higher-order process based on model reduction method and fractional coefficient filter with real-time verification,' *Chemical Product and Process Modeling*, ISSN: 1934-2659, vol. 15, no. 3, pp. 20190089, (DOI: 10.1515/cppm-2019-0089), 2020.
- [11] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Designing of dynamic Kalman filter for prediction of mean arterial blood pressure,' *Procedia Computer Science*, ISSN: 1877-0509, vol. 167, pp. 2478-2485, (DOI: 10.1016/j.procs.2020.03.300), 2020.
- [12] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Designing of Fuzzy rule based switching mechanism for IMC controller for temperature controlling process,' *Procedia Computer Science*, ISSN: 1877-0509, vol. 167, pp. 1363-1369, (DOI: 10.1016/j.procs.2020.03.347), 2020.

Book chapters:

- [1] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘*Fuzzy-based auto-tuned IMC-PID controller for real-time level control process*,’ Computational Intelligence, Communications, and Business Analytics, vol. 775, Springer, Singapore, Editors: Satapathy et al., ISBN: 978-981-10-6426-5, pp. 372-381, (DOI: 10.1007/978-981-10-6427-2_30), 2017.
- [2] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘*Fuzzy-based adaptive IMC-PI controller for real-time application on level control loop*,’ Frontiers in Intelligent Computing: Theory and Applications, vol. 515, Springer, Singapore, Editors: Mandal et al., ISBN: 978-981-10-3152-6, pp. 387-395, (DOI: 10.1007/978-981-10-3153-3_38), 2017.
- [3] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘*Fuzzy-tuned SIMC controller for level control loop*,’ Industry Interactive Innovations in Science, Engineering and Technology, vol. 11, Springer, Singapore, Editors: Bhattacharyya et al., ISBN: 978-981-10-3952-2, pp. 239-245, (DOI: 10.1007/978-981-10-3953-9_23), 2017.
- [4] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘*Switching mechanism of internal model control based PI controller for lag dominating processes*,’ Nanoelectronics, Circuits and Communication Systems, vol. 692, Springer, Singapore, Editors: V. Nath, and J. Mandal, ISBN: 978-981-15-7485-6, pp. 347-355, (DOI: 10.1007/978-981-15-7486-3_32), 2020.
- [5] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘*Controlling of Twine Rotor MIMO System based on Multivariable Model Predictive Control*,’ Nanoelectronics, Circuits and Communication Systems, vol. 692, Springer, Singapore, Editors: V. Nath, and J. Mandal, ISBN: 978-981-15-7485-6, pp. 493-499, (DOI: 10.1007/978-981-15-7486-3_44), 2020.

Conferences:

- [1] **U. M. Nath**, S. Datta, and C. Dey, ‘Centralized auto-tuned IMC-PI controllers for industrial coupled tank process with stability analysis.’ In: IEEE 2nd International Conference on Recent Trends in Information Systems (ReTIS), pp. 296-301, (DOI: 10.1109/ReTIS.2015.7232894), Kolkata, India, July 9-11, 2015.
- [2] S. Datta, **U. M. Nath**, and C. Dey, ‘Design and implementation of decentralized IMC-PI controllers for real time coupled tank process.’ In: Michael Faraday IET International Summit (MFIS-2015), pp. 93-98, (DOI: 10.1049/cp.2015.1613), Kolkata, India, September 12-13, 2015.
- [3] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘Model identification of coupled-tank system - MIMO process,’ In: IEEE Second International Conference on Electrical, Computer and Communication Technologies (ICECCT), pp. 284-289, (DOI: 10.1109/ICECCT.2017.8118012), Coimbatore, India, February 22-24, 2017.
- [4] **U. M. Nath**, C. Dey, and R. K. Mudi, ‘Design of modified model-based adaptive control system for FOPDT processes,’ In: IEEE 4th International Conference on Power, Control and Embedded Systems (ICPCES), pp. 1-5, (DOI: 10.1109/ICPCES.2017.8117667), Allahabad, India, March 9-11, 2017.
- [5] R. Sengupta, **U. M. Nath**, and C. Dey, ‘Design and performance analysis of a modified MRAC for second-order processes,’ In: IEEE 4th International Conference on Power, Control and

Embedded Systems (ICPCES), pp. 1-5, (DOI: 10.1109/ICPCES.2017.8117630), Allahabad, India, March 9-11, 2017.

- [6] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Enhanced half rule based model reduction scheme for higher-order processes,' In: IEEE 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICT), pp. 312-315, (DOI: 10.1109/ICICT46008.2019.8993175), Kerala, India, July 5-6, 2019.
- [7] **U. M. Nath**, C. Dey, and R. K. Mudi, 'Designing of anti-windup feature for internal model controller with real-time performance evaluation on temperature control loop,' In: IEEE 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICT), pp. 787-790, (DOI: 10.1109/ICICT46008.2019.8993360), Kerala, India, July 5-6, 2019.

Research credentials:

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Citations : 124

Reviewer:

1. IEEE Transactions on Industrial Informatics (IEEE Transactions)
2. IEEE Transactions on Industrial Electronics (IEEE Transactions)
3. IEEE Access (IEEE)
4. International Journal of Control (Taylor and Francis)
5. Asian Journal of Control (Wiley)
6. Industrial & Engineering Chemistry Research (American Chemical Society)
7. International Transactions on Electrical Energy Systems (Wiley)
8. IETE Journal of Research (Taylor and Francis)
9. Control Theory and Technology (Springer)
10. Chemical Product and Process Modeling (De Gruyter)

NPTEL certificate courses:

Subject	Type	Duration	Organization
Chemical Process Control	FDP	8 weeks	IIT Bombay
Control Engineering	FDP	12 weeks	IIT Madras
Process Control Design, Analysis and Assessment	Self-development	12 weeks	IIT Madras

Participations:

Activities	Organization	Duration	Topic
FDP	Jorhat Engineering College	6 days (03/12/2018-08/12/2018)	Recent advantages in Photonics
	IIT Roorkee	5 days (20/05/2019-24/05/2019)	Power Electronic Converters
	IIT Roorkee	10 days (23/06/2020-02/07/2020)	Machine Learning and IoT with AWS
Pedagogy training	Jorhat Engineering College	3 days (26/11/2018-28/11/2018)	Introduction to Outcome Based Education
	Punjab University	5 days (11/03/2019-15/03/2019)	Innovative Approaches in Teaching and Research
	IIT Madras	5 days (24/06/2019-28/06/2019)	Teaching Learning
Training	WBSEDCL	15 days (01/07/2009-15/07/2009)	Testing of Electrical Devices
	NIT Warangal	5 days (07/03/2016-11/03/2016)	STTP on Advanced Process Control
Workshop	Jadavpur University	2 days (19/10/2016 & 20/10/2016)	Recent Trends in Signal Processing
	NIT Warangal	6 days (12/12/2016-17/12/2016)	GIAN course on Advanced Process Control
	Jadavpur University	1 day (10/03/2017)	Emerging Prospects in Wireless Sensor Network
	Jadavpur University	1 day (15/03/2017)	Sensor Systems for Agricultural Applications
Seminar	IET Kolkata	1 day (06/04/2013)	Role of Automation Plant Safety
	MathWorks	1 day (10/10/2016)	Designing for Reliability and Robustness using Matlab & Simulink
