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Dr. Nitin Jagannath Patil

- Objective** Developments of advanced techniques in the field of control engineering & Signal Processing.
- Career Summary**
- An erudite academican with high caliber and extensive experience of over 15+ years, developing results driven curriculum and delivering enthusiastic instruction students.
 - Currently working as Professor in Instrumentation Engineering at D. N. Patel College of Engineering, Shahada.
 - Ability to individualize instructions based on students specialized and changing needs, proven ability to develop rapport with students.
 - Qualified Ph.D. (Instrumentation Engineering) recognized for a strong and excellent academic background and knowledge of the domain area of study.
 - Demonstrated ability in designing course curriculum and implementing innovative instruction methodologies to match college standards.
 - Proficient in creating innovative strategies and formulating management as well as administrative policies for accelerated growth of the organization.
- Key Skills** Administration • Innovative Curriculum Development • Classroom Management • Parental Involvement • Student Assessment
- Experience** 2015 - till date D. N. Patel College of Engineering, Shahada
- Professor in Instrumentation Engineering**
- Guided M.E. E & Tc students for seminar and dissertation work.
 - Shouldering the charge of Head of the Department from October 2012.
 - Developed Microcontroller Lab, Biomedical Lab, Process Automation Lab.
 - Member, Board of Studies, Electrical & Instrumentation Engineering, North Maharashtra University Jalgaon
 - Member, Board of Studies, Instrumentation Engineering, Government College of Engineering, Jalgaon (Autonomous Institute)
 - Member of S.E., T.E. and B.E. Instrumentation Syllabus setting for North Maharashtra University Jalgaon.
- 2010- 2015 D. N. Patel College of Engineering, Shahada
- Associate Professor in Instrumentation Engineering**
- Developed Transducer Lab, Signal Processing and Image Processing Lab.
 - Developed method based on rule base modification scheme for fuzzy controller for performance improvement and Self Tuning Scheme for Fuzzy Controller.

2004–2010 D. N. Patel College of Engineering, Shahada

Assistant Professor in Instrumentation Engineering

- Development of Artificial Intelligent (Expert) Systems such as Fuzzy based Image Compression, Fuzzy Controller using Neural Defuzzifier, Fuzzy Controller using Genetic Tuning method, Fuzzy based image segmentation.
- Developed Fuzzy pre-compensated PID Controller for temperature control of the tank process.
- Developed Optimal PID controller using MATLAB.
- Developed various small projects like testing kits as minor project Incharge.
- Developed various projects such as Digital Image processing using MATLAB.
- Developed various projects using ABB, Allen Bradley, Gold-star, Mitsubishi, Modicon, and Siemens PLC's.
- Studied ABB DCS and developing projects based on the same.
- Training & Placement Officer from year 2007 - 2009, organized various training programs for pre-final and final year engineering students. Also arranged campus interviews by nominated companies like Mahindra and Mahindra, Reliance Energy, Powerika, Jasubhai Engineering, Rishabh Metals and Chemicals, Emco, TCS, Wipro, IBM at D N Patel College of Engineering, Shahada.

2001–2004 D. N. Patel College of Engineering, Shahada

Lecturer in Instrumentation Engineering

- Taught subjects like process modelling and optimization, modern control theory, digital signal processing, microprocessor techniques etc.
- Guided various interfacing techniques of process with PC using C++ .
- Guided project "**Satellite Tracking System**" got first prize in State Level Project Competition organized by Srujan at SSVPS COE, Dhule.
- Developed various projects using Anshuman PLC.

Education

January 2013 Swami Ramanand Teerth Marathwada University Nanded, Maharashtra.

- **Ph. D. (Instrumentation Engineering) Thesis Title: "Design of Adaptive Fuzzy Controllers" under the guidance of Dr. R.H. Chile and Dr. L. M. Waghmare at research centre SGGSIET, Nanded**
- Developed Rule Base Modification scheme for FOPDT and SOPDT Processes.
- Developed PID based tuning method for fuzzy controllers.
- Developed self tuning method for fuzzy controllers.
- Developed Adaptive Fuzzy PI Controller for PMSM Process.
- Developed modified method for PID controller Tuning in MATLAB.
- Developed Matlab based Simple Fuzzy PID Controller for Tank Level Control.

August 2000 Swami Ramanand Teerth Marathwada University Nanded, Maharashtra.

- **M. E. (Instrumentation) at S.G.G.S. College of Engineering and Technology, Nanded.**
- **Dissertation Title: "Implementation of Model reference Adaptive Control System for Temperature Control of an Electric Oven" under the guidance of Dr. R.H. Chile.**

- Delivered seminar on "Significance of Group Delay Functions in Signal Reconstruction from phase and magnitude".
- Studied different subjects like Digital Image processing, Biomedical Instrumentation, Modelling and Simulation, Estimation and Identification etc.
- Studied various Biomedical Instruments like EEG, ECG, EMG, Spiro meter X-Ray etc.

July 1997 **North Maharashtra University, Jalgaon, Maharashtra.**

- **B. E. (Instrumentation)** at D.N. Patel College of Engineering, Shahada.
- **Developed Project on "Programmable Liquid Level Controller" under guidance of Prof. K. N. Patel.**
- Delivered seminar on "Boiler Instrumentation in Power Plant".
- Undergone In-plant Training at National Power Station Eklahare, Nashik.
- Studied various Subjects like Digital Signal Processing, Instrumentation System Design etc.

Ph.D. Thesis

Design of Adaptive Fuzzy controllers

Fuzzy control has met a tremendous interest in applications over past decade and also among manufacturers of control equipment. There are a number of reasons for the popularity of fuzzy control. Real life control objectives are nonlinear since their dynamics change with the operating point and there may be other essential nonlinearities in the process. This generates need for controllers with nonlinearities. An approach to cope with nonlinearity in conventional control is gain scheduling method i.e. to change parameters with the operating point. Due to rule base operation of fuzzy controller they are another choice for nonlinear process control applications. A fuzzy control system is a real time expert system, implementing a part of a process operator's experience which is not easily possible to express in PID controllers or in terms of differential equations. Though the fuzzy controllers perform better than the conventional controllers, there is a need of tuning the fuzzy controllers for the system with changing dynamics. Also the rules of fuzzy controller do not contain a temporal component so they cannot cope with process changes over time. So there is need for adaptive fuzzy control.

By considering the fact, it is decided to focus on the parameters of the fuzzy control and develop a kind of adaptive fuzzy controller. Following objectives has been decided so far as this research is concerned:

1. Scaling Factors, their effects on performance and computation of scaling factors using PID parameters and modified structure of fuzzy controller.
2. Rule base types, rule base generation, possibilities of modification of rule base and to check effect of modified rule base on different process models.
3. Development of tuning mechanism for scaling factors of fuzzy controller using function of error, model error.
4. Development of adaptive mechanism for fuzzy controller using fuzzy model controller.

M.E. Dissertation

Implementation of Model Reference Adaptive Control System for Temperature Control of Electric Oven.

Adaptive control is an important area of modern control, dealing with the

control of systems in the presence of uncertainties, structural perturbations and environmental variations. Several adaptive control strategies have been successfully applied in diverse practical problems. Adaptive control techniques have great potential, as these methods can cope with increasingly complex systems in the presence of extreme changes in system parameters and input signals.

The model reference strategy was chosen for controlling the temperature of the laboratory oven. The other strategies like PID control with automatic tuning, Dead Beat, Dahlin digital controllers have been tried out in the past for the same purpose and hence it was felt that a comparative study shall enable to justify the importance of adaptive control. The method chosen essentially consists of applying step input to the process which was previously in a steady state and then from the output of the process the model of the process i.e. process parameters are obtained which is used as model in the proposed algorithm. Using the error calculated between the model output and process output the controller parameters are tuned continuously through the adaptation mechanism so that the error between the process and model output tends towards zero. In this case the control objective is to control the temperature of the oven so the temperature is the controlled variable and the temperature is controlled according to the quantity of the electrical energy supplied to the oven, so, supplied electrical energy is the manipulated variable.

Areas of Interest	Artificial Intelligence - Fuzzy Logic, Image Processing, Signal Processing, Process Control, Adaptive Control etc.
Computer Literacy	C++, Matlab, Simulink, MS-Office, Flash 5, Circuit Maker, Electronic Workbench, Lab-view etc.
Date of Birth	16 / 08 / 1976.
Gender	Male.
Languages	Marathi, English, Hindi, Gujrathi.
Hobbies	Cricket, Reading, Photography.
References	<p>Dr. R. H. Chile Professor, Instrumentation Engineering S.G.G.S. Institute of Engineering & Technology, Nanded. Contact – 09226777168, rhchile@sggs.ac.in</p> <p>Dr. R. S. Holambe Professor, Instrumentation Engineering S.G.G.S. Institute of Engineering & Technology, Nanded. Contact – 09850297269, rsholambe@sggs.ac.in</p>
Address for Correspondence	5, Dwarka Niwas, Vrindavan Nagar, Near Shree Swami Samarth Kendra, Old Mohida Road, Shahada, Dist.- Nandurbar (M.S.) Shahada- 425409.

**Paper Presented
and Published in
National &
International
Conferences and
Journals**

International Conferences

1. N. J. Patil, R. H. Chile, "Design of TS Fuzzy Controller for Batch Reactor", RACE 2007, Government College of Engineering, Bikaner, Rajasthan, India.
2. Dipak Patil, N. J. Patil, "FPGA Implementation of Reed Soloman Code", Adelco 2007, National Engineering College, Kovilpatti, Tamilnadu, India.
3. N. J. Patil, D. P. Patil, M. N. Patil, "An Approach for Image Enhancement using Fuzzy Logic", RACE 2007, Government College of Engineering, Bikaner, Rajasthan, India.
4. D. P. Patil, N. J. Patil, K. Y. Chaudhari, D. S. Ajnar, "Design of DCT based Decoder and Encoder using VHDL", ICIT 2007, DIT, Dehradun, India.
5. N. J. Patil, R. H. Chile, "An Adaptive Fuzzy Logic Control System for Industrial Temperature Regulation", ICICNO 2007, Angers, France, India.
6. N. J. Patil, R. H. Chile, L. M. Waghmare, "An Adaptive Fuzzy Logic Control System for Industrial Temperature Regulation", CICINDIN-2007, Mexico City, Mexico.
7. N. J. Patil, R. H. Chile, L. M. Waghmare, "Design of Model Reference Adaptive Fuzzy Controller", IET- ICTES 2007, Chennai, India.
8. N. J. Patil, R. H. Chile, L. M. Waghmare, "Designing Fuzzy Logic Controller based on Genetic Algorithms", INCRUIS 2008, Erode, Tamilnadu, India.
9. N. J. Patil, R. H. Chile, L. M. Waghmare, "Design of Model Reference Adaptive Fuzzy Controller for CSTR Process", ICAC 2008, Buldana, India.
10. N. J. Patil, R. H. Chile, L. M. Waghmare, "Design of Model Reference Adaptive Fuzzy Controller for Green House Process", ICSCI 2009, Hyderabad, India.
11. N. J. Patil, R. H. Chile, L. M. Waghmare, "A Novel Approach to Model Reference Adaptive Fuzzy Controller using Output Scaling Factor", FuzzySS'09, Ankara, Turkey.
12. N. J. Patil, R. H. Chile, L. M. Waghmare, "Hybrid Model Reference Adaptive Fuzzy Controller", ICETET2009, Nagpur.
13. N. J. Patil, R. H. Chile, L. M. Waghmare, "Implementation of Adaptive Fuzzy Controllers for Speed Control of PMSM Drive", ACM- ICFCA 2010, Bangalore, Karnataka, India.
14. N. J. Patil, R. H. Chile, L. M. Waghmare, "Input Scaling Factors Based Fuzzy Adaptive Controller", ICAECT 2010, MIT, Manipal, India.
15. N. J. Patil, R. P. Borse, "Rule Base Modification Scheme for Improved Performance of FOPDT Process using PI like Fuzzy Controller", IEEE-INDICON 2013, IIT, Powai, Mumbai.
16. N. J. Patil, R. P. Borse, "Tuning of Fuzzy Controller using Set Point Weighing PID Parameters", International Conference on Pervasive Computing, ICPC 2015, Sinhgad Institute of Engineering, Pune.
17. R. M. Sathe, N. J. Patil, V. K. Patil, "Investigation in FIR Filter to Improve Power Efficiency and Delay Reduction", International Conference on Pervasive Computing, ICPC 2015, Sinhgad Institute of Engineering, Pune.

National Conferences

1. N. J. Patil, R. H. Chile, "Fuzzy Logic Based PID Controller Tuning Method", CISCON 2006, Manipal Institute of Technology, Manipal.
2. N. J. Patil, R. H. Chile, "Design of Fuzzy PID Controller for Control Application", NCDSP 06, Fr. CRCE, Bandra, Mumbai.
3. N. J. Patil, R. H. Chile, "Hybrid Fuzzy Logic Controller for Temperature Control System", RTIT 06, JTMCOE, Faizpur.
4. N. J. Patil, M. N. Patil, "Significance of Group Delay Functions in Spectrum Estimation", RTIT 06, JTMCOE, Faizpur.
5. N. J. Patil, R. H. Chile, "Design of Simple Fuzzy PID Controller", BITCON 2007, Bhilai Institute of Technology, Durg, CG.
6. N. J. Patil, R. H. Chile, "Implementing Fuzzy Adaptive Controller for Process Control", NCDIM 2007, Thadomal Shahani College of Engineering, Mumbai.
7. N. J. Patil, R. H. Chile, "Fuzzy Control System using VHDL", BITCON 2007, Bhilai Institute of Technology, Durg, CG.
8. N. J. Patil, M. N. Patil "Image Enhancement using Fuzzy Logic", NCDIM 2007, Thadomal Shahani College of Engineering, Mumbai.
9. N. J. Patil, K. Y. Chaudhari, D. S. Ajnar and D. P. Patil, "Implementation of Discrete Wavelet Transform (DWT) using VLSI for Image Compression", NCCSP 2007, TSEC, Mumbai.
10. N. J. Patil, Kiran Y, Chaudhari, D. S. Ajnar, "Fuzzy Based Image Compression & Clustering", ICICT 07, NMIMS, Mumbai.
11. N. J. Patil, R. H. Chile, L. M. Waghmare, "Rule Base Modification Scheme for Improved Performance of FOPDT Process using PI like Fuzzy Controller", ISCP 13, SGGSIET, Nanded.

International Journals

1. N. J. Patil, R. P. Borse, "VSC Type Sliding Mode Controller Design for Heat Exchanger Process", *International Journal for Scientific Research & Development*, vol. 4, no. 8, pp. 375-377, 2016.
2. N. J. Patil, "Design of Model Reference Self Tuning Mechanism for PID like Fuzzy Controller", *International Journal of Current Engineering and Technology*, vol. 4, no. 1, pp. 585-589, 2014.
3. S. Javare, N. J. Patil, and S. P. Patil, "Brain Tumor Segmentation and Area Calculation of Tumor by Use of Unsupervised Clustering Algorithm", *International Journal of Advanced Research in Computer Science and Software Engineering*, vol. 4, no. 11, pp. 322 - 325, 2014.
4. S. Javare, N. J. Patil, and V. K. Patil, "Brain MR Image Segmentation Technique: A Review", *Transactions on Engineering and Sciences (TES)*, vol.2, no. 12, pp. 23-27, 2014.
5. N. J. Patil, R. H. Chile, L. M. Waghmare, "Improved Performance of SOPDT Process using Rule Base Shifting Scheme for Fuzzy PI Controller", *International Journal of Control, Automation and Systems, Springerlink*, 2013.
6. N. J. Patil, R. H. Chile, L. M. Waghmare, "Design of Adaptive Fuzzy PI Controller using Output Scaling Factor and Reference Models", *International Journal on Control and Intelligent Systems*, ACTA Press, Canada, 2013.
7. N. J. Patil, R. H. Chile, L. M. Waghmare, "Design of Model Reference Adaptive Fuzzy Controller for CSTR Process", *International Journal on Computer Science & Application (IJCSA)*, 2009.

8. N. J. Patil, R. H. Chile, L. M. Waghmare, "Design of Model Reference Adaptive Fuzzy Controller", *IETECH Journal, International Engineering & Technology Publications, 2008.*
9. N. J. Patil, R. H. Chile, L. M. Waghmare, "Industrial Temperature Control using an AFLC", Special Issue on *Industrial Informatics, Journal on Research in Computing Science, 2007.*

Books

Design of Adaptive Fuzzy Controllers: Some issues in Structural and Tuning Parameters, by N. J. Patil, R. H. Chile , L. M. Waghmare (Author), Scholars' Press, **ISBN-10:** 3639706439.

FDP/ STTP/ Workshops Attended

1. National Workshop on "Scilab and Its Applications to Global Optimization and Fractional Differential Equations organized by SGGSIET, Nanded from 23-25 April 2010.
2. National Workshop on "DSP and Its Application in Industry", Organized by SGGSIET, Nanded on 20-21 March 2010.
3. National Workshop on "Embedded Systems" Organized by SITRC, Nasik on 12-14 March 2010.
4. University Workshop on "BE Instrumentation and BE Electrical Syllabus Framing for North Maharashtra University, Jalgaon" Organized by D. N. Patel College of Engineering, Shahada on 14 February 2015.
5. National Workshop on "Research Methodology and Tools" Organized by D. N. Patel College of Engineering, Shahada on 16-17 January 2016.

Professional Membership

1. Life Member of The Indian Society for Technical Education (ISTE), Delhi
Membership Number: **LM 42106.**
2. Life Member of Instrument Society of India (ISOI), Bangalore
Membership Number: **LM 1391.**
3. Member of International Association of Computer Science and Information Technology (IACSIT), Singapore.
Membership Number: **80337344**