VARSHA BHAMBHANI

RESEARCH INTEREST

Robotics and Control	Mechatronics
Sensor Calibration	Time Delay Systems
Computer Networking	System Identification
Optimization and Robust Control	Fractional Order Calculus

EDUCATION

Masters of Science (M.S.) in Electrical Engineering (Expected graduation date: **May 2008**)
Utah State University, Logan, UT 84321, U.S.A
Dissertation: Optimum Fractional Order Proportional-Integral (OFOPI) controller for varying time delay systems
Current Cumulative GPA: 3.67/4.0
Research Advisors: *Dr. Y. Q. Chen, Dr. W. Ren, Dr. E. Spencer*

Bachelors in Electronics and Communication Engineering, August 2006, with ***Distinction***
Ujjain Engineering College, Ujjain (M.P.), India
Dissertation: CDMA transceiver for multi-path channels
Research Advisors: Prof. *R. Gayakwad, Prof. V. Choudhary, Prof. G. Tiwari*

GRADUATE COURSE WORK AT USU, UT

ECE 5320: Mechatronics	ECE 6600: Computer Networking I
ECE 5340: Mobile Robots	ECE 6800: Colloquium
ECE 6320: Linear Multivariable Control	ECE 6930: Independent Study (fractional Order Calculus)
ECE 6350: Robotics	ECE 7360: Optimal & Robust Control

RESEARCH EXPERIENCE

Aug 06 - Present **Graduate Research Assistant**
Center of Self Organizing and Intelligent Systems (CSOIS), USU, UT

- Multi-Objective Optimization and design of Optimal Fractional order PI Controller for varying time delay systems.
- System Identification, PID/ Fractional PI Controller tuning of real-time mechatronics lab experimental setups Viz. Coupled Tank System and Ultrasonic water level system. (*****currently extending the application to **Smart Wheel Platform**).
- Blind Calibration of lysometer measuring soil moisture.
- Irrigation canal modeling and controller design.

ADDITIONAL EXPERIENCE

Aug, 06 - Present **Teaching Assistant**, ***Department of Electrical and Computer Engineering, USU, UT***

- ECE 6320 (**Linear Multivariable Control**) offered in **fall 2006**.
- ECE 3870 (**Electromagnetic I**) offered in **spring 2007**.
- ECE 2500 (**Electrical Circuits**) offered in **fall 2007**.
- ECE 3410 (**Microelectronics I**) offered in **spring 2008**.

Aug, 06 - Feb, 07 Participated in **Sumo Robot Competition 2007** sponsored by **Ball Aerospace**

(E-week competitions 2007 at USU).

July, 05 - Aug, 05 -	**Networking Internship, Netyantra India Pvt. Ltd., Mumbai,** India**.** Learned about Netyantra's unique NY-Cube Technology, NY-Cube IPB Cluster/servers, NY-Cube IPCC Clusters, web interfaces, end-end user devices etc.
June, 04 - July, 04	**Industrial Training, SDE (CDOT), Bharat Sanchar Nigam Ltd.,** India.
Jan, 02 - May, 04	Administrative Officers**, Anand Enterprises,** Ujjain, India.

COMPUTER SKILLS

Languages and Packages	C, C++, assembly (8086), BASIC, TRUE BASIC, C BASIC, MATLAB & Simulink, HOSA toolbox, RIOTS, OOP for OOPIC micro-controllers, MS Office, LATEX etc..
Operating Systems	Windows XP, 98/2000, DOS, LINUX, MAC OS 10.4.10.

SERVICES & AFFILIATION

Jan, 07- Present	Member of IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications (MESA).
Aug, 06- Present	Member of Center of Self Organizing and Intelligent Systems (CSOIS), USU.
Aug, 07- Present	Member of Fractional Order Control research study group meeting at Center of Self Organizing and Intelligent Systems (CSOIS), USU.
2005- 2006	**President,** Science Club, Student Chapter, Ujjain Engineering College, Ujjain.
2005- 2006	**Public Relation In-Charge,** Training & Placement Cell, U.E.C., Ujjain.
2001- 2002	Elected **Secretary,** Computer Club, St Mary's Convent School, Ujjain.

ACHIEVEMENTS

2006	Paper on "The Robotic Digital Eye" selected to second phase in **Tech Zephyr 2006** held at national level organized by Ujjain Engineering College, Ujjain, India.
2004	**Appreciation Award'04 JK Chemicals,** Mumbai, **National Level**.
2000	**Appreciation award'00, S.M.A,** Ujjain, school level.
1999	**Second Prize'99, School chess contest,** S.M.A Ujjain.
1999	Passed **Junior Mathematics Olympiad Contest'99, National Level**.
1993	**Second Prize, All India Camel Color Contest' 93, National level**.

PRESENTATIONS & DEMONSTRATIONS

Feb, 08 -	"Fractional controller PI controller in liquid level and flow control" at FOC group study meeting, at CSOIS, USU, UT.
Dec, 07 -	"Fractional controller for guidance of autonomous ground vehicles" at FOC group study meeting, at CSOIS, USU, UT.
Nov, 07 -	"A note on use of Lambert W function for stability analysis of time delay systems" at FOC group study meeting, at CSOIS, USU, UT.
Oct, 07 -	Demonstration of FOC plant and other integer order PI/PID controllers to control water level of Coupled Tank System PP-100 at Hewlett Packard Controls Lab at USU, UT.
Sept, 07 -	"Comparison of OFOPI controller with other Integer Order PI/PID Controllers" at FOC organized at Utah State University.
May, 07 -	Blind Calibration (Soil Moisture Data Analysis & Sensor Calibration) at Water Research Lab WRL, USU, UT.
April, 07 -	Non-linearity & Distortion Analysis using HOSA toolbox at CSOIS special interest group meeting, USU, UT.
April, 06 -	Presentation on "The Robotic Digital Eye" at Tech Zephyr 2006 at U.E.C., Ujjain, India.

CONFERENCES

Sept, 07 - Attended American Society of Mechanical Engineers (ASME'07) at Las Vegas, Nevada.

PUBLICATIONS

1) **V. Bhambhani, Y. Q. Chen, D. Xue, "**Optimum Fractional Order Proportional Integral (OFOPI) Controller for Varying Time Delay Systems" accepted to International Federation of Automatic Control 2008.
2) **V. Bhambhani, Y. Q. Chen, "**Practical tuning of Fractional Order Proportional-Integral (FOPI) Controller **:** Experiments", International Journal of Control, Automation and Systems. (**In Progress)**
3) **H. Ahn, V. Bhambhani and Y. Q. Chen, "**Fractional-order Integral and Derivative controller design for temperature control" submitted to Chinese Control and Decision Conference 2008.

REFERENCES

1) **Dr. YangQuan Chen,** Assistant Professor, Department of Electrical & Computer Engineering, Utah State University, Logan, UT 84321,USA. Ph: (435) 512-7541, Email: YQChen@engineering.usu.edu
   Website: http://mechatronics.ece.usu.edu/yqchen

2) **Dr. Wie Ren,** Assistant Professor, Department of Electrical & Computer Engineering, Utah State University, Logan, UT 84321,USA. Ph: (435) 754-7113, Email: WRen@engineering.usu.edu
   Website: http://www.neng.usu.edu/ece/faculty/wren

3) **Dr. Edmund A. Spencer,** Assistant Professor, Department of Electrical & Computer Engineering, Utah State University, Logan, UT, 84321,USA. Ph: (435) 754-8203, Email: EASpencer@cc.usu.edu
   Website: http://space.ece.usu.edu/~espencer/