Arjun Singh Bhadouria

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SUMMARY

A chemical engineering graduate with a firm understanding of signal processing, multivariate data analysis, time series analysis, Monte-Carlo simulations, process control and mathematical modeling. I am looking for a full time position in an industry with emphasis on model estimation, process optimization, design of experiments and process control.

EDUCATION

Program	Institution	%/CGPA	Year of Completion
M.S. in Chemical Engineering	Rensselaer Polytechnic Institute, Troy, NY	3.90/4	2015
M.S. in Chemical Engineering (Transferred)	Texas A&M University, College Station, Texas	3.68/4	2012 (Transferred)
B.Tech & **M.Tech** in Chemical Engineering **Minor:** Operations Research	IIT Madras, Chennai, India	8.01/10 (3.2/4) Minor: 9/10 (3.6/4)	2011

RESEARCH EXPERIENCE

M.S.: Experimental Design & Optimization of membrane separation processes for protein fractionation (Sep '12 – Dec '15)

- Ultrafiltration is a nonlinear process with multiple process parameters, therefore an optimization of operating parameters is important to achieve to find an optimal operating condition
- Employed empirical model fitting for the process to find optimal operating regime of a protein UF process
- Nonlinear experimental design can help in reducing the number of experiments to be carried out for gaining information for this model fitting and thereby reducing time and cost
- Experimental design using partial least squares regression was performed to determine the next point to conduct the experiment at given some limited initial dataset iteratively improving the model at every step

M.Tech.: Signal Estimation using Empirical Mode Decomposition (EMD) (Jun '09 – Jul '11)

- A measured signal is usually embedded in nonlinear noise which isn't easily removed with traditional linear filters
- EMD exhibited better reconstruction than Wavelets and Wiener even for linear mixing models in comparison
- Further presented that reconstruction of a nonlinear measured signal using EMD is much better than Wavelets
- Developed a method to use correlations with the noisy signals of the individual IMFs extracted using EMD to reconstruct an estimate of the signal which improves the earlier studies

PROFESSIONAL EXPERIENCE

Honeywell Technology Solutions Lab, Bangalore, India (Intern) (May '08 - Jul '08)

- Studied the fundamentals of various mathematical models used for Catalytic Fixed Bed reactor
- Derived a newly formulated Wave model which could be used by the company for development of their products
- Compared the Wave model with existing Standard Dispersion model which revealed an improvement

Gujarat State Fertilizers and Chemicals, Baroda, India (Vocational Training) (May '07 – Jun '07)

- Worked in Melamine and Methyl Ethyl Ketoxime plants and learnt about the methods adopted by GSFC in manufacturing, distribution, automation and control
- Analyzed the P&I diagrams and checked the mass and energy balances whether they conformed to theory
- Proposed minor changes they could implement to their manufacturing process based on Le Châtelier's principle to increase the productivity

MENTORING/TEACHING EXPERIENCE

Teaching Assistant: Chemical Engineering Laboratory II, *RPI, Troy* (Jan '15 – May '15)

- Responsible for Recrystallization experiment and Nanoviscosity experiment for Spring 2015 Senior class

Research Mentor: *Emma Willard School, Troy* (Oct '14 – May '15)

- Mentored a High School Student from Emma Willard School as part of their Signature STEAM Internship

Teaching Assistant: Chemical Reaction Engineering Lab, *IIT Madras* (Aug '09 – Dec '09)

PUBLICATIONS AND CONFERENCES

Journal Paper

- A. S. Bhadouria, M. Sorci, M. Gu, G. Belfort, and J. Hahn, "Optimization of membrane separation processes for protein fractionation," *Ind. Eng. Chem. Res.*, vol. 53, no. 13, pp. 5103–5109, **2014**

Presentations

- A. S. Bhadouria and J. Hahn, "Optimal experimental design using partial least squares regression," in *2015 41st Annual Northeast Biomedical Engineering Conference (NEBEC)*, **2015**, pp. 1–2
- A. S. Bhadouria; M. Sorci; M. Gu; G. Belfort and J. Hahn, "Ultrafiltration Optimization via Experimental Design," in 2013 *American Institute of Chemical Engineers Annual Meeting (AICHE),* **2013**
- A. S. Bhadouria and J. Hahn, "Optimization of Membrane Separation of Proteins," in *2013 James R. Fair Process Science and Technology Center (PSTC) Fall Meeting,* **2013**
- A. S. Bhadouria; M. Sorci; G. Belfort and J. Hahn, "Optimization of membrane separation of proteins," in *2012 National Institutes of Health trainee meet and greet (NIH),* **2012**

SKILLS

Software: MATLAB, Scilab, AUTO 97, IPOPT, R, ANSYS Fluent, Microsoft Office, LaTeX

Programming languages: C, C+

RELEVANT COURSES

- System Identification
- Multivariate Data Analysis
- Time Series Analysis
- Systems Analysis Techniques
- Model Predictive Control
- Math. Methods of Oper. Res.

EXTRA-CURRICULAR ACTIVITIES

- Represented RPI and I.I.T. Madras in Badminton team, Cricket team
- **Captain** of RPI Cricket team 2015, I.I.T. Hostel Badminton team 2004, I.I.T. Hostel Hockey team 2003
- **Founding member** of Upstate New York Cricket Association - A non-profit organization formed to organize league cricket and spread the game of cricket in the Capital Region (Sep 2014 – Present)
- Volunteer in AID (Association for India's Development) – A non-profit organization aimed to collect funds and send them to various charitable projects working in India by voting on which projects to fund and track the progress (Dec 2012 – Present)
- Fabricated a working windmill from scratch to produce electricity at the technical festival of my undergraduate college in 2007 using low cost materials as part of a challenge by SHELL winning the third position among 15 shortlisted teams
- Made a successful single seater Hovercraft at the technical festival of my undergraduate college in 2005 as part of Spirit of Engineering working in a team of 15 student volunteers for three months for the success of the project. We made the Hovercraft with minimum resources possible using old two-wheeler engines for lift and propulsion