

Anand P. Deshmukh

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408 E Michigan Ave, 5, Urbana, IL, 61801, USA

Education	University of Illinois at Urbana–Champaign PhD, Systems Engineering, 3.83/4.0 MS, Industrial Engineering, 3.86/4.0 Birla Institute of Technology and Science, Pilani, India BS, Mechanical Engineering, 8.86/10.0	December 2016 May 2013 May 2008
Core Expertise	Applied Machine Learning, Mathematical Optimization, Clustering, Time-series Analysis, Forecasting, Operations Research, Applied Statistics, Linear Algebra, Control Theory	
Skills	Languages: Python, R, MATLAB, JAVA, SQL Tools: MySQL, Scikit-learn, matplotlib, Numpy, Scipy, Theano, NLTK, pandas, Weka, Gurobi	
Professional Experience	Energy Management Software Intern, Bosch Research, Palo Alto, CA, USA Summer 2015 Improved the electric load forecasting by 4% with k-means clustering and neural networks for Bosch's energy management software that aggregates energy from photo-voltaic cells, power grid and optimally dispatches the battery power to minimize the electricity demand charge. Research Intern, John Deere, Champaign, IL, USA Summer 2012 Built nonlinear regression models using historic yield and several agrometeorological data in R for forecasting crop yields and wrote a complex discrete event simulation software from scratch in MATLAB for large-scale agricultural decision making. Engineer/Technologist, General Electric, Bangalore, India July 2008 – July 2011 As a part of GE's prestigious and highly selective technical leadership (EEDP) program, I worked on challenging projects ranging from production quality software development to product design and analysis. Following are the highlights of my tenure at GE: <ul style="list-style-type: none">• Reduced the solution delivery time for application engineers from 3+ weeks to 3 days by building a numerical optimization software in JAVA for compressor selection• Analyzed novel thermal clearance management strategies for gas turbines• Built end-to-end chemical process data management system resulting in significant reduction in project times for global design teams and mitigation of erroneous data transmission	
Projects	Neural Networks for Natural Language Processing Spring 2016 <ul style="list-style-type: none">• Built feedforward and convolutional neural network based multi-class classifier for entity recognition, relations extraction and co-reference resolution in text using Python/Theano• Achieved 72% F1-score for entity recognition and 73% F1-score for relations extraction• Cleaned and curated the noisy annotation data for accurate classification Machine Learning for Non-intrusive Electric Load Monitoring Spring 2015 <ul style="list-style-type: none">• Built a multi-class classifier using Python/Scikit-learn to non-intrusively predict individual electric device energy consumption from whole-house electric meter data• Achieved 74% classification accuracy by training Random Forest classifier on noisy data Optimization Algorithms for Energy Management in Power Grid August 2011 – Present <ul style="list-style-type: none">• Developed sophisticated optimization algorithms for renewable energy management in power grid consisting of disparate and stochastic energy sources• Solved large scale optimization problems using state of the art solvers in MATLAB• High impact peer-reviewed publications – 2 journal, 6 conference proceedings	
Relevant Coursework	Machine Learning, Machine Learning in Natural Language Processing, Big Data Statistics and Clustering, Convex Optimization, Large Scale Optimization, Nonlinear Programming, Design of Experiments, Distributed Control, Optimal Control	

Honors	Clean Energy Research Fellowship , University of Illinois	2013 – 2015
	Industrial and Systems Engineering Fellowship , University of Illinois	2011 – 2012
Leadership & Outreach	Interactive Curriculum Developer , 4-H Foundation of Illinois, Champaign, IL	2014 – 2015
	Developed curriculum 'Wind energy: wind to wall outlet' to teach youth benefits of wind energy and associated engineering design process through interactive web-based activities.	
	Technical Lead, Reconfigurable Suspension Team , Urbana, IL	2013 – 2014
	Successfully led a team of four students on \$40k industry sponsored project to design actively controlled reconfigurable quarter-car suspension testbed. Supervised overall design process, led component integration and guided undergraduate students on deliverables.	
Selected Publications	Anand P Deshmukh , James T Allison. 'Multidisciplinary Dynamic Optimization of Horizontal Axis Wind Turbine Design.' Struct. and Multidisc. Optimization, 53(1), pp. 15-27, Jan 2016	
	Anand P Deshmukh , Daniel R Herber, James T Allison. 'Bridging the Gap between Open-Loop and Closed-Loop Control in Co-Design: A Framework for Complete Optimal Plant and Control Architecture Design.' In 2015 American Control Conference, pp. 4916-4922, Jul 2015	
	James T Allison, Daniel R Herber, Anand P Deshmukh , 'Integrated Design of Dynamic Sustainable Energy Systems.' In International Conf. on Engineering Design, Milan, Italy, Jul 2015	
	Anand P Deshmukh , James T Allison, 'Design of Nonlinear Dynamic Systems using Surrogate Models of Derivative Functions' In ASME International Design Engineering Technical Conferences, Portland, OR, USA, Aug 2013.	
	Anand P Deshmukh , James T Allison, 'Simultaneous Structural and Control System Design for Horizontal Axis Wind Turbines', In AIAA Multidisciplinary Design Optimization Specialist Conference, AIAA 2013-1533, pp. 1-11, Boston, MA, USA, Apr 2013.	
	Anand P Deshmukh , Marlon E Mitchell, James T Allison. 'Integrating Model-Based Design and Physical Design Evaluation for Improved Design Education.' In ASME International Design Engineering Technical Conferences, to appear, Charlotte, NC, USA, Aug 2016.	
	Daniel R Herber, Anand P Deshmukh , Marlon E Mitchell, James T Allison. 'Project-Based Curriculum for Teaching Analytical Design to Freshman Engineering Students via Reconfigurable Trebuchets.' Education Sciences, 6(1), p. 7, Feb 2016.	
	Anand P Deshmukh , Deborah L Thurston, James T Allison. 'Heuristics for Formulating Design Optimization Models: Their Uses and Pitfalls.' In 5th Internations Engineering Systems Symposium, CESUN 2016, to appear, Washington, D.C., USA, June 2016.	