

Achin Jain

Moore 201, 200 South 33rd Street
Philadelphia, PA 19104
(267) 939 1167
✉ achinj@seas.upenn.edu
🌐 www.achinjain.in

Education

- 07/15–today **University of Pennsylvania (UPenn)**, Philadelphia, U.S.A.
Ph.D. in Electrical and Systems Engineering
Advisor: Rahul Mangharam
- 09/12–02/15 **Swiss Federal Institute of Technology (ETH) Zurich**, Switzerland.
Master of Science in Robotics, Systems and Control
Advisors: Manfred Morari, Christopher Onder
- 07/08–05/12 **Indian Institute of Technology (IIT) Delhi**, India.
Bachelor of Technology in Mechanical Engineering

Experience

- 01/18–today **Flexergy AI**, Philadelphia, U.S.A.
Co-founder and Chief Technology Officer
- 07/15–12/17 **Real-time and Embedded Systems Lab, UPenn**, Philadelphia, U.S.A.
Graduate Research Assistant
- 07/14–12/14 **Daimler A.G.**, Stuttgart, Germany.
Master Thesis Student
- 04/14–12/14 **Institute for Dynamic Systems and Control, ETH Zurich**, Switzerland.
Master Thesis Student
- 09/13–02/14 **ABB Corporate Research**, Dättwil, Switzerland.
Intern at Control and Optimization Group
- 02/13–08/13 **Automatic Control Laboratory, ETH Zurich**, Switzerland.
Semester Thesis
- 05/12–07/12 **Arts et Métiers ParisTech**, Metz, France.
Visiting Researcher at Design, Manufacturing and Control Laboratory
- 07/11–05/12 **Mechatronics Lab, IIT Delhi**, India.
Bachelor Thesis

Teaching

- Fall 2017 **Machine Learning**, CIS 520 UPenn.
Teaching Assistant
- Summer 2017 **Intro to Probability and Statistics**, ENM503 UPenn.
Teaching Assistant
- Spring 2017 **Model Predictive Control**, ESE619 UPenn.
Teaching Assistant
- Fall 2016-17 **Real-Time Embedded Systems**, ESE519 UPenn.
Instructor for lectures (2) on real-time control systems

Technical Skills

- Programming Python, MATLAB, R, C++
- Machine Learning scikit-learn, TensorFlow, GPML, Pandas
- Optimization CPLEX, CVX, YALMIP, MPT, CasADi, CVXOPT, IPOPT
- Modeling Simulink, EnergyPlus, Modelica, SolidWorks, Ansys APDL/Workbench

Coursework

Machine Learning	Machine Learning, Reinforcement Learning, Online Methods in Machine Learning
Probability & Statistics	Theory of Probability, Mathematical Statistics, Applied Regression and Analysis of Variance, Applied Econometrics
Optimization & Controls	Convex Optimization, Model Predictive Control, Dynamic Programming and Optimal Control, Recursive Estimation, Systems Identification, Control Systems-II, Vehicle Propulsion Systems, Nonlinear Controls, Linear Systems Theory
Miscellaneous	Robotics, Advanced Robotics, Vehicle Propulsion Systems

Honors and Awards

- 2017 Selected for Amazon's 5th annual Graduate Research Symposium
- 2017 Travel Award for the 56th IEEE Conference on Decision and Control (CDC)
- 2017 Energy Systems **Best Paper Award** at the 2017 IEEE American Control Conference (ACC)
- 2016 3rd prize in CIS 520 Machine Learning Competition on Tweet Classification, UPenn
- 2016 **Best Presentation Award** at the 3rd ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys), Stanford University
- 2016 Diversity Scholarship, PyData Chicago
- 2016 Selected for GE Student Research Summit
- 2016 Selected for French-American Doctoral Exchange (FADEX) on Cyber-Physical Systems, Grant from Office of Science and Technology, Embassy of France in the US
- 2015 **Master's Degree with Distinction** for scoring overall grade 5.75+, ETH Zurich
- 2012 **Swiss Government Excellence Scholarship (ESKAS)**, ETH Zurich
- 2012 Scholarship by ParisTech Foundation
- 2012 BOSS Award for the **Best Experimental Bachelor Thesis**, IIT Delhi
- 2012 Samsung Innovation Award, finalist
- 2011-12 Undergraduate Scholarship, IIT Delhi
- 2008-09 Semester Merit Awards (2) for ranking in top 7% in the batch, IIT Delhi

Publications

Journals

- J4 F. Smarra*, **A. Jain***, T. Rubeis*, D. Ambrosini, A. D'Innocenzo, R. Mangharam. Data-Driven Model Predictive Control using Random Forests for Building Energy Optimization and Climate Control. Applied Energy, 2018.
- J3 **A. Jain**, F. Smarra, M. Behl, R. Mangharam. Data-Driven Model Predictive Control with Regression Trees – An Application to Building Energy Management. ACM Transactions on Cyber-Physical Systems, 2018. [\[pdf\]](#)
- J2 **A. Jain**, T. Nüesch, C. Nägele, P. M. Lassus, C. H. Onder. Modeling & Control of a Hybrid Electric Vehicle with an Electrically Assisted Turbocharger. IEEE Transactions on Vehicular Technology, 2016. [\[pdf\]](#)
- J1 **A. Jain**, G. Schildbach, L. Fagiano, M. Morari. On the design and tuning of linear model predictive control for wind turbines. Renewable Energy, 2015. [\[pdf\]](#)

Conferences

- C9 **A. Jain**, D. Nong, T. X. Nghiem, R. Mangharam. Digital Twins for Efficient Modeling and Control of Buildings – An Integrated Solution with SCADA Systems. Building Performance Analysis Conference and SimBuild, 2018. [\[under review\]](#)
- C8 F. Smarra, **A. Jain**, R. Mangharam, A. D'Innocenzo. Data-driven Switched Affine Modeling for Model Predictive Control. 6th IFAC Conference on Analysis and Design of Hybrid Systems, 2018.
- C7 **A. Jain***, T. X. Nghiem*, M. Morari, R. Mangharam. Learning and Control using Gaussian Processes. 9th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS), 2018. [\[pdf\]](#)
- C6 **A. Jain**, F. Smarra, R. Mangharam. Data Predictive Control using Regression Trees and Ensemble Learning. 56th IEEE Conference on Decision and Control (CDC), 2017. [\[pdf\]](#)

- C5 **A. Jain**, M. Behl, R. Mangharam. Data Predictive Control for Building Energy Management. American Control Conference, 2017. [\[pdf\]](#)
- C4 **A. Jain**, M. Behl, R. Mangharam. Data Predictive Control for Peak Power Reduction. 3rd ACM International Conference on Systems for Energy-Efficient Built Environments (BuildSys), 2016. [\[pdf\]](#)
- C3 M. Behl, **A. Jain**, R. Mangharam. Data-Driven Modeling, Control and Tools for Cyber-Physical Energy Systems. IEEE 7th International Conference on Cyber-Physical Systems, 2016. [\[pdf\]](#)
- C2 **A. Jain**, J. Qin, G. Abba. Optimal Work Placement for Robotic Friction Stir Welding Task. 3rd IFToMM International Symposium on Robotics and Mechatronics (ISRM), 2013. [\[pdf\]](#)
- C1 P. Ajay, P. Singhal, **A. Jain**, S. Mukherjee. Teleoperation through Brain Machine Interface. National Conference on Emerging Trends in Mechanical Engineering, 2012. [\[pdf\]](#)

Technical Reports and Thesis

- T3 **A. Jain**, K. Jang. Classification of Tweets using Supervised and Semisupervised Learning, CIS520 Machine Learning Competition, University of Pennsylvania, 2016 [\[pdf\]](#)
- T2 **A. Jain**. Optimal Control of a Hybrid Electric Vehicle with an Electrically Assisted Turbocharger, Master's Thesis, ETH Zurich, 2014 [\[pdf\]](#)
- T1 J. Poland, **A. Jain**, K. So. Ordinal Regression for Meta-Modeling in Optimization. Technical Report, ABB Corporate Research Switzerland, 2014 [available upon request]

Invited Talks

Learning and Control using Gaussian Processes

- 04/2018 University of L'Aquila, Italy
- 02/2018 Guest Lecture in ESE 680: Learning and Control, University of Pennsylvania, USA

From Energy Efficiency to Energy Flexibility for Smart Cities

- 02/2018 Smart Cities Forum, Perry World House, Philadelphia, USA

Bridging Machine Learning and Controls for Volatile Energy Markets

- 08/2017 Amazon, Bangalore, India
- 08/2017 Flipkart Data Science, Bangalore, India
- 08/2017 TCS Innovation Labs, Bangalore, India
- 05/2017 Microsoft Research Redmond, USA [\[video\]](#)
- 05/2017 University of Washington, Seattle, USA
- 03/2017 Ph.D. Colloquium, University of Pennsylvania, USA

Data Predictive Control for Energy Cyber-Physical Systems

- 07/2016 University of L'Aquila, Italy
- 07/2016 French-American Doctoral Exchange, Grenoble, France

Optimal Control of a Hybrid Electric Vehicle with an Electrically Assisted Turbocharger

- 02/2016 Ph.D. Colloquium, University of Pennsylvania, USA
- 12/2014 Daimler AG, Stuttgart, Germany

Other Activities

- Reviewer Journal of Artificial Intelligence Research (JAIR), 2018
- ACM/IEEE International Conference on Cyber-Physical Systems (ICCPs), 2018
- American Control Conference, 2017
- IEEE Transactions on Vehicular Technology, 2015
- IEEE IET Control Theory and Applications, 2015
- Foundations and Trends in Electronic Design Automation, 2015
- Energies MDPI, 2015
- Secretary Society of Automotive Engineers (SAE) IIT Delhi, 2011-12
- Coordinator Suspension Department, Formula Racing Team IIT Delhi, 2010-11
- Speaker CAD Workshops, IIT Delhi, 2011