Adhithyan Sakthivelu

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EDUCATION

Stanford University — **Stanford, CA**
Master's in Science, Civil and Environmental Engineering - Atmosphere & Energy — *June 2023*

National Institute of Technology, Trichy — **Trichy, India**
Bachelor's in Technology, Instrumentation and Control Engineering — *June 2018*

RESEARCH EXPERIENCE

Water & Energy Efficiency for the Environment (WE3) Lab — **Stanford, CA**
Research Assistant — *April 2023 to Present*

- Developed risk-averse optimal bidding strategy of water resource recovery facility's participation in Demand Response (DR) markets using model predictive control and recursive grid-search
- Analyzed and modeled demand response events based on program and simulation parameters to model DR events in future grid scenarios

SLAC National Accelerator Lab — **Stanford, CA**
Research Assistant — *April 2022 to Present*

- Developed **heuristic bidding strategy** for **distributed resources** to participate in **transactive** (peer-to-peer) **energy markets**
- Used optimal control strategies for devices such as Batteries, PV, HVAC, Water heater and EVs to analyze the market performance of the heuristic strategy
- Developed market mechanism and rules for a new transactive market that does continuous market clearing using Limit Orderbook and studied its economic and stability performance. **IEEE PESGM conference best paper award**

WORK EXPERIENCE

Deloitte US India Consulting — **Bengaluru, India**
Consultant — *August 2018 to August 2021*

- Customized and configured **Salesforce Lightning Platform** and Apttus CPQ manged package for Lead-to-Cash lifecycle
- Analyzed and processed raw data, transformed them to Salesforce compatible schema, then built automated algorithm for data housekeeping

Dr. Reddy's Laboratory — **Hyderabad, India**
Project Intern — *June 2017 to August 2017*

- Analysed the existing **Water Purification and Distribution System** and optimized its process
- Suggested **modifications** and **improvements** to increase the **level of control** and minimize instrument and process failures that resulted in 50% reduction of instrument error

PROJECT EXPERIENCE

Optimized Operation of HVAC system with TOU electricity pricing and weather prediction data — **Stanford, CA**
Course Project — *March 2022 to May 2022*

- Created a MPC model using **convex optimization** for electric heat pumps that minimizes the total cost while maintaining comfort for the customers given the electricity retail price and weather prediction data

An Energy-Efficient Ride-Sharing Algorithm Using Distributed Convex Optimization — **Stanford, CA**
Course Project — *March 2022 to May 2022*

- Developed a ride-sharing optimization with focus on energy-efficiency and decentralized decision-making agents for rider pickup and drop-off, as part of localized clusters of connected cars
- Used distributed convex optimization (ADMM) to solve several local energy-efficient drop-off optimizations on the edge (run on each vehicle) in parallel, followed by solving a master energy-efficient pickup optimization problem

Online US Wind Energy Atlas for Potential windfarm development — **Stanford, CA**
Project Assistant — *May 2021 to Sep 2021*

- Used **QGIS, PyQGIS** and **ArcGIS online** platform to build website to show feasible areas of windfarm development in the United States, which got presented at **Glasgow COP26**
- Developed dynamic rendering of total area available for wind farm development, total potential energy output and per capita energy availability based on the paper, https://doi.org/10.1016/j.segy.2021.100046
- Website: windenergyatlas.stanford.edu

PUBLICATIONS

- Sreekumar, Akshay, **Adhithyan Sakthivelu**, Rimvydas Baltaduonis, Lynne Kiesling, Seth Hoedl, and David P. Chassin. "**A Real-Time Limit Order Book as a Market Mechanism for Transactive Energy Systems**." arXiv, May 19, 2023. http://arxiv.org/abs/2305.11464 (***IEEE PESGM'23 Best Paper Award)***
- Sreekumar, Akshay*, **Adhithyan Sakthivelu***, and Lynne Kiesling. "**Auction Theory and Device Bidding Functions for Transactive Energy Systems: A Review.**" Current Sustainable/Renewable Energy Reports 10, no. 3 (September 1, 2023): 102–11. https://doi.org/10.1007/s40518-023-00217-2 (*- equal contribution)

LEADERSHIP, VOLUNTEERISM & COMMUNITY SERVICE

***President*,** Nakshatra, The Astronomy Club of NIT Trichy
Executive Manager, National Service Scheme funded by Govt of India
Climbing Instructor, Stanford Outdoor and Recreation Center

SKILLS, COURSEWORK & INTERESTS

- **Software Skills**: Python, Julia, MATLAB, LaTeX, Java, Git, GitHub Actions, QGIS, ArcGIS, Salesforce Lightning Development, Apex development, Salesforce Configuration, MS Excel – Advanced, SQL Database
- **Relevant Coursework**: Electricity Markets, Electricity Economics, Engineering Future Electricity Systems, Convex Optimization, Decision Making Under Uncertainty, Data Structures and Algorithms, Engineering Optimization, Digital Signal Processing, Product Design, Advanced Feedback Control
- **Languages**: English, Tamil, Hindi
- **Extracurriculars and Interests**: Stanford Climbing Team, Yoga Instructor, Rock Climbing, Backpacking, Volunteering