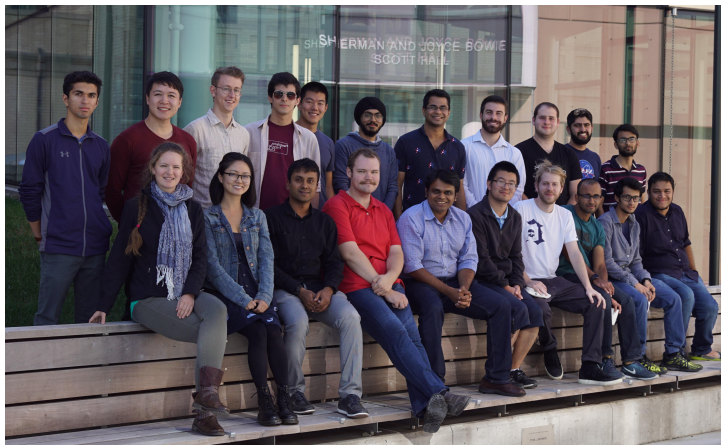


Positions in Venkat Viswanathan's Group

Carnegie Mellon University

Our interdisciplinary group comprises of ~25 researchers (13 PhD students, 2 Postdocs, 7 Masters students, 4 Undergrads) working on technologies that can accelerate the transition to sustainable energy. We actively recruit from MechE, ChemE, Materials Science and Physics departments at Carnegie Mellon. Students are encouraged to pick the discipline that is the best fit for them. However, if you have a strong interest in **joining our group**, please apply to the **MechE department** and indicate your interest to work in our lab in your research statement. [Research Website](#)



Projects for 2017-18 cycle

- **Electric Flights:** Synergistic electrode-electrolyte assembly design for next-generation Li-ion batteries to achieve high discharge rates, high specific energy with an economically viable cycle life. Collaboration with several stealth-mode startups. (1-2 PhD positions)
- **Ultrafast and Low-Temperature Charging:** Optimize electrode-electrolyte design coupled with advanced charging protocols. Collaboration with MIT (Yet-Ming Chiang). (2 PhD positions)
- **Data-Driven High-Throughput Experimentation:** Design of experiments through 'maximal-information-gain' approaches to analyze battery performance. Collaboration with Voltaiq, B. Poczoz (ML, CMU). (1-2 Postdoc positions)
- **Fuel Cells Catalysis:** Evaluate the potential of novel ALD-synthesized Pt catalysts. Collaboration with Stanford (Prinz, Jaramillo group) and Volkswagen. (1 PhD position)
Metal Organic Framework derived non-Pt based oxygen reduction catalysts. Collaboration with Shawn Litster (CMU), Gang Wu (University at Buffalo). (1 PhD/Postdoc position)
- **Electric Semi-Trucks and Autonomous Driving:** Join our ongoing work on electric semi-trucks ([media coverage](#)). Battery control algorithms to enable platooning, etc to optimize energy consumption and explore synergy of autonomous driving and electric vehicles. (1-2 PhD position)
- **EV Security:** Examination of battery packs to cyber vulnerabilities to develop new mechanisms of control and detection. Collaboration with Vyas Sekar (ECE, CMU). (1 PhD position)

Methodological interests

- Computational material design
- Density functional theory simulations
- Phase-field modeling
- Data-driven material discovery
- Controls for Energy Systems
- High-performance (GPU) computing

Application Areas

- Next generation batteries for EVs and aircraft
- Fuel cells
- Electrocatalysis for chemical-&-fuel synthesis
- Bio-inspired and bio-mimetic materials

Expected Skill Sets:

- Strong knowledge of thermodynamics and mathematics (numerical methods)
- Strong programming skills (MATLAB/Mathematica/Python)