David Lu

Email: david_lu@brown.edu **Phone:** (650)307-8226 **GitHub:** https://github.com/davidluca123

Education:

Brown University, Class of 2020 (3.89 GPA) – Sc.B. Chemistry & Computer Science
Select Courses: Software Engineering; Computer Systems; Algorithms and Data Structures; Object-Oriented Prog.; Data Science; Adv. Organic Chemistry; Organometallic Chemistry; Quantum Chemistry; Inorganic Chemistry; Thermodynamics; Nanoscale Materials; Materials Science; Dynamics and Vibrations; Statics and Eng. Computing; Cell and Molecular Biology

Leadership and Engagement:

1. **H2OK, Founder** (1/2018 – present)
   - Developed lab on a chip, cell phone based safe drinking water diagnosis technique
   - Designed glass bead microscope attachment and image recognition algorithm to determine presence of harmful microbes in water along with treatment methods. Location data used to create map of contaminated water sources
2. **Chemistry Department Undergraduate Chair** (5/2018 – present)
   - Invite professionals and alumni for research and career seminars, set up graduate and undergraduate advising groups, implement safe spaces for underrepresented groups in STEM, organize student and faculty department events, etc.
   - Manage group budget and finances, including applying for department grants and organizing fundraisers
3. **BrownEP, Special Events Team** (9/2018 – present)
   - Connect employers and students by coordinating BrownEP's Speaker Series and Sustainability Series, company visits through the Synapse program, and Startup@Brown (the largest annual startup event on campus)
4. **Cloud Agronomics, Co-Founder and Head of Research & Development** (1/2017 – 3/2018)
   - Designed and built high endurance solar-powered UAV with spectral imaging capabilities to cheaply manage sustained aerial data acquisition in agriculture to detect and isolate infestation sites undetectable to the human eye
   - Worked with US Solar Works, NASA, Boeing, and Brown and Stanford professors
5. **Brown Space Engineering, Power Team and Research Team** (9/2016 - present)
   - Developed satellite launched by NASA to the ISS, from which it was deployed
   - Patented use of LiFePO4 batteries in space and a new satellite power board coating technique
   - Tested LiFePO4 batteries, solar panels, and power supply of satellite

Research Experience:

1. **Brown University Chemistry Department, Andrew Peterson Lab**, Student Researcher (2/2018 – present)
   - Calculate lattice structure, active sites, and binding energies using DFT for H_2 evolution reactions in catalysts
   - Use AMP to employ ML for atomistic simulations to reduce calculation and computational cost
2. **Technical University of Munich PREP Fellowship, Gasteiger Lab**, Researcher (6/2018 – 8/2018)
   - Synthesized high active heme biomimetic FeNC (iron and nitrogen doped in carbon) catalysts for ORR
   - Conducted BET N_2 abortion test to determine catalyst surface area and pore size distribution
   - Analyzed catalytic properties and activity for oxygen reduction reactions through RDE tests
3. **Brown University Chemistry Department, Jason K. Sello Lab**, Student Researcher (6/2017 – 6/2018)
   - Disrupted peroxidase and cyclic AMP gene in *Streptomyces* (*Mycobacterium tuberculosis* model) bacteria via PCR targeting and tested for H_2O_2 susceptibility to determine new targets for antibiotics against TB.
   - *In vitro* well microplate antimicrobial drug susceptibility tests via resazurin microtiter assay
4. **Lawrence Berkeley National Laboratory, Ren Lab**, Research Intern (6/2014 – 6/2016, 5/2017 – 6/2017)
   - Developed micro-chamber for first ever visualization of various phenomena including phase changes, Brownian motion, and liquid gas interface behavior of low melting point samples under TEM
   - Co-authored research paper, under review by *Physical Reviews Fluids*
   - Reconstructed 2D Cryo-EM images of HDL, LDL, and CETP into 3D models to determine possible drug target sites
5. **Hebei HuaXu Chemical Co.** (Chemical/Pharmaceutical company), Research Assistant (6/2016 - 7/2016)
   - Optimized D-phenylglycine prod. by modifying phenylhydantoin synthesis, hydrolysis, and enantiomer separation
   - Analyzed products and impurities using TLC, HPLC (normal and chiral), and NMR

Honors and Awards:

- Brown Innovation Dojo Pitch Competition 1st Place – **H2OK**
- HackMIT – **Data Vis. Award**–find & show sentiment impact of each local on company stock price using news data
- Hult Prize Finalist, Get Started RI: Pitch Competition Finalist, Brown Venture Prize and Startup Storm Global Business Plan Competition 2nd Place, Inaugural Penn Aerospace Pitch Competition 3rd Place – **Cloud Agronomics**
- Siemens Competition in Math, Science, & Technology Semifinalist – **LBNL, Ren Lab**

Skills:

- **Tech:** Python, Java, C, R, HTML+CSS, JavaScript, MATLAB, SolidWorks, Atomic Sim. Env., Atomistic ML Pkg.
- **Chem/Bio:** GC, HPLC, TLC, IR Spec, Mass Spec, NMR, BET, XRD, RDE, Electron Microscopy, NanoDrop Spec, DNA & protein extraction and purification, PCR, Gel Electrophoresis, SDS-PAGE, Cell Culture, Primer Design
- **Rapid Prototyping:** Metalworking, woodworking, laser cutting, 3D printing, soldering
- **Languages:** English, Chinese