

Bruce Lin

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SUMMARY

Experienced engineer and manager with a successful record of 15 years in research and product development, from banknote thickness sensors to battery power plants, with special interest in new technology and energy. Available for consulting, projects, and other opportunities.

PROFESSIONAL EXPERIENCE

Director of Systems Engineering, EnerVault (flow battery startup) November 2011 – February 2015, Sunnyvale, CA

- Responsible for design, build, and commissioning of the world's highest power and energy iron-chromium battery. My role was to integrate the novel battery and electrolyte into the overall prototype plant and solar farm - <https://gigaom.com/2014/05/23/an-almond-farm-a-big-ass-battery-show-the-future-of-energy-in-california/>
- EnerVault is a small company (20-30 people) so this position was a mix of individual contribution, and functional and project management of a team of 3-10 electrical, mechanical, chemical, software engineers, contractors and consultants.
- Developed technical requirement specifications, controlled documentation, and cascaded the subsystem requirements for the various parts of the energy storage system.
- Created and maintained models of mass and energy in order to drive design decisions and testing. These spreadsheets were based on engineering calculations of chemical composition, flow rate, electrochemistry, electrical parameters, etc. Mentored other staff in thermal analysis.
- Performed a wide variety of hands-on work including several months on the project site in Turlock, CA – tested equipment, calibrated sensors, and assembled parts.
- Analyzed performance data (temperature, pressure, voltage, current, etc.) in order to solve technical problems relating to control algorithms and system performance.

Engineering Consultant, 42 Technology (25-person engineering consultancy) April 2010 – October 2011, St. Ives, UK

- Led the company's new offering in energy and clean technology – a mix of business development / sales, and managing projects after they were won.
- Managed a 12-month banknote thickness sensor project, from innovation workshops through to design for manufacture. Reduced cost by 75% relative to the previous solution. The sensor was shipped as part of the client's banknote sorting product. <http://www.42technology.com/news/banknote-handling-systems/>
- Project manager for a novel room fragrance dispenser prototype for a large multinational fast moving consumer goods

**Head of System/Stack Engineering, CMR Fuel Cells (fuel cell startup)
September 2006 – December 2009, Cambridge, UK**

- Ran flagship project to design a 25 W battery range extender from scratch for notebook computers. Very similar to the EnerVault position but at the portable electronics size.
- Worked with Asian battery pack company partner to agree on product requirements, including average and maximum power, use cases, and runtime. Documented product and system requirements.
- Defined key development projects using modeling and engineering trade studies (Excel based and hand calculations)
- Performed tests to solve problems relating to fuel contamination; pump material incompatibility; electrical shorting; reactant flow distribution.

**Senior Research Engineer, Ballard Power Systems (fuel cell manufacturer)
September 1999 – June 2006, Vancouver, Canada**

- Designed and ran hands-on experiments to optimize power, efficiency, and reliability of hydrogen fuel cell stacks for automobiles with partners Ford and Daimler.
- Led a special task force to solve sub-freezing problems. This was a mix of performing experiments and managing tasks and schedules. The team won an internal "Award of Excellence", and the technology was shipped in the Mercedes B-Class "F-Cell" vehicle.
- Worked on system integration of the fuel cell stacks into the automotive fuel cell systems – developed startup protocols to stay within energy and thermal budgets.

EDUCATION

Princeton University

Master's in Mechanical and Aerospace Engineering, 1997 – 1999

Thesis on hydrogen fuel cell scooters, as a means of reducing air pollution in Asian cities (concept design, MATLAB modeling, and engineering assessment)

Queen's University, Canada

B.Sc. in Engineering Physics (Materials), 1993 - 1997

Thesis on superconducting magnetic energy storage for railroads

ADDITIONAL SKILLS

Analytical:	Computer modeling, understanding data from complex systems, designing and running experiments, reviewing patents, FMEA.
Management:	Leading technical teams; dealing with suppliers, contractors, customers.
Software:	Some MATLAB and Solidworks, standard Office tools, etc.
Languages:	English (native); basic French, German, and Chinese.
Innovation:	7 U.S. patent applications pending, 2 granted
Other interests:	puzzle hunts; Ultimate frisbee; competing on television game shows (3 countries so far)