Kevin CEDRONE

Accomplished science and engineering researcher with extensive experience in thermal, fluid, and energy systems. Broad technical knowledge, proven track record of learning quickly and applying new information to design, build and test mechatronic hardware systems. Excellent communicator with experience managing interdisciplinary teams.

March 2013	PhD in mechanical engineering	GPA: 5.0/5.0	Massachusetts Institute of Technology
May 2010	MS in mechanical engineering	GPA: 5.0/5.0	Massachusetts Institute of Technology
June 2008	BASc mechanical engineering	GPA: 4.0/4.0	University of Waterloo, Canada

Skills

- Prototyping proof-of-concept devices including analog and digital electronics, mechatronic systems including sensors, actuators, data acquisition and microcontrollers.
- Strong working knowledge of SolidWorks, Matlab, C/C++, Python; Familiar with Ansys, Abaqus, ADAMS
- Private Pilot's License (pursuing night, multi-engine, instrument ratings)
- Bilingual in reading, writing and speaking French, English. Conversational Mandarin Chinese.

Research

Massachusetts Institute of Technology

2013 – 2014

As a postdoctoral associate with Dr. Leslie Bromberg, I led a research team to experimentally test an engine-based reformer for converting methane-rich gas to liquid hydrocarbon fuels.

2010 – 2013

My doctoral research with Professor Wai K. Cheng included:

- Design, construction and operation of a full-scale engine test system,
- Examining hydrocarbon emissions, efficiency and stability during engine cold start,
- Simulating the thermochemical response of engine catalyst system during start-up.

2008 – 2010

For my SM research with Professor Wai K. Cheng, I experimentally tested the effects of fuel composition and alcohol content on the behaviour of advanced Controlled Autoignition (CAI) engines, and communicated findings to industrial research partners.

Industry

AIR: Augmented Infant Resuscitator (Boston, MA)

Fall 2012-Present

Designed, built, validated and field-tested a medical device to monitor, evaluate and record positive pressure ventilation, and give objective feedback in real time.
Initial working prototype built in less than one day at MGH Hacking Medicine Hackathon.
Raised over $700,000 from research grants and awards.

Formlabs (Somerville, MA)

Feb. 2014-Oct 2015

I directed a research and development program to prototype new 3D printer technologies and processes including electromechanical, optical and material systems.

Eversight Systems (Cambridge, MA)

2011- 2012

As a technical co-founder, I helped to develop and deploy a solar-powered, mesh network sensor system for landfill gas energy generation. Successfully raised $50k angel funding.

Toyota Motor Manufacturing Canada (Cambridge, Ontario)

Fall 2007

Maintained 99.9% uptime, implemented kaizens for a fleet of assembly line material handling robots. Worked on team to plan the MY09 Corolla/Matrix major model upgrade. Subsequently retained as an independent contractor to manage $150k capital project.

Electricité de France – (Bugey, France)

Spring 2007

As a site engineering service intern, my targeted inspection/testing program to re-qualify critical steam circuitry after emergency pressure relief events was projected to save €14M.

Industry

Research in Motion (Waterloo, Canada)

Spring 2006 — Worked on team to develop, test and deploy new equipment and processes for BlackBerry handset manufacturing. Originated and lead a PFMEA process for new products.

Cesaroni Technology (Gormley, Canada)

2004-2005 — Developed a high-frequency radio induction welding process, and assembly. Implemented an ISO-compliant quality programs for cruise missile boost motor components.

Leadership

Massachusetts Institute of Technology

2009 – 2013 — Mentored five undergraduate research assistants including two projects that culminated in bachelors theses in mechanical engineering at MIT.

Spring 2010, 2012 — As a teaching assistant for Internal Combustion Engines I conducted recitation sessions, designed and conducted laboratory exercises. Received "Excellent" rating from students.

2012 — Worked with the Chancellor, Provost and MIT administration to guide MITx development.

Summer 2011 — Traveled to Shenzhen, China to mentor high school students on topics including leadership and community outreach as part of the MIT China Development Initiative.

2010 – 2011 — As President of the Graduate Association of Mechanical Engineers, I oversaw a budget of $15,000 to plan social, professional and academic events for 500+ graduate students.

Service

2015	Venture advisor, maker-guru for The Possible Project Makerspace
2013-2014	Served on working group with former MIT Chancellor to issue a graduate housing report.
2010-2013	Co-chair of Graduate Student Council off-campus subcommittee: oversaw $6k budget, increased activity level by over 300%, increased outreach to students, families and children.
2011-2012	Teaching assistant for Cambridge Community Services.

Awards

April 2014	Best Prototype at Hacking Medicine Hackathon for new bed sore monitoring system.
October 2013	Oral Excellence Award for outstanding presentation at KSAE PF&L conference.
May 2013	First place at Athenahealth Hacking Medicine Hackathon for new drug delivery system.
April 2013	D-Lab Scale-ups Fellowship.
April 2013	IDEAS Global Challenge, Dow Sustainability Innovation Student Challenge Award.
Jan. 2013	CAMTech Innovation Award.
Oct. 2012	First place, best overall invention at MGH Hacking Medicine Hackathon.

Publications and Patents

- Cedrone, K.D. et al. 'Augmented Infant Resuscitation (Air) Device To Improve Management Of Intrapartum Related Deaths ("Birth Asphyxia")'. *Appropriate Healthcare Technologies for Low Resource Settings (AHT 2014)* (2014):
- Cedrone, K., Cheng, W.K., "SI engine control in the cold-fast-idle period for low HC emissions and fast catalyst light off", SAE 2014-01-1366, 2014.
- Cedrone, K., Cheng, W.K., "Using Valve Timing and Exhaust Back Pressure to Improve Catalyst Warm-Up Time", SAE 2013-01-2656, 2013.
- Bromberg, L., Cohn, D., Cedrone, K., "Ultra-High Efficiency Methanol Engines with Advanced Exhaust Energy Recovery". Conference presentation. 20th International Symposium on Alcohol Fuels (ISAF), Stellenbosch, South Africa, March 26, 2013.
- "Augmented Resuscitator", US Provisional Patent No. 61/728211, November 2012.
- Cedrone, K., Cheng, W.K., Chahine, S., William, J., VanDerWege, B., "Fuel Effects on HCCI Operation in a Spark Assisted Direct Injection Gasoline Engine", JSAE 20119230 / SAE 2011-01-1763, 2011.