

MARK KELLENBERGER

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Canada

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Project Portfolio: markkellenberger.com

Experienced engineering researcher passionate about sustainability and innovative technologies. I love to set audacious goals to intentionally confront the edge of my abilities and build new skills and resilience. The scope of my research, a track record of leadership, and extensive curiosity have prepared me to solve complex engineering challenges. My mindset as an engineer is: "I don't know yet, but I'll figure it out".

EDUCATION

PhD	Mechanical Engineering	Queen's University, Kingston, ON
Thesis: <i>Supersonic combustion wave propagation in an obstructed volume of hydrogen</i>		
MASc	Mechanical Engineering	Queen's University, Kingston, ON
Thesis: <i>Dense particle cloud dispersion by a shock wave</i>		
BSc	Mechanical Engineering	Queen's University, Kingston, ON
Senior research project: <i>Experimental investigation of shock-induced dispersion of an alumina particle cloud</i>		

EXPERIENCE

Lead Engineering Researcher	2012 – 2021
Associate Engineering Researcher	2010 – 2012

Explosion Physics and Prevention Laboratory – Queen's University

Research of high-speed reactive flows, focused on hydrogen combustion and explosion safety for sustainable energy applications. Findings communicated in 9 peer-reviewed articles and at 15 national and international conferences.

- Designed, constructed, and maintained innovative experimental facilities, equipment, and prototypes
- Developed and deployed server and network infrastructure for scientific computing and data management
- Pioneered new experimental techniques and designed experiments to address challenging technical problems
- Analysed experimental and simulation data to develop and adapt computational thermo-fluid models
- Managed multiple deadline-sensitive complex projects with international colleagues and industry partners
- Trained and mentored junior and visiting researchers and guided research progress for simultaneous projects
- Oversaw laboratory operations including coordination of equipment and supply orders to stay within budgets
- Implemented strict equipment safety measures and fail-safe designs to ensure personnel and public safety

Project Consultant	2015 – Present
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Self-employed – North Vancouver, BC and Kingston, ON

Provide consulting expertise in residential construction and IT hardware and networking solutions.

Select projects:

- Design and support of home networks including firewall and storage appliances for backup and remote access
- Design and construction of water storage and purification system meeting Public Health Ontario standards
- Design and construction of below-grade sewage handling and ejection system meeting Ontario Building Code

Course Instructor	2010 – 2018
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Department of Mechanical and Materials Engineering – Queen's University

Course instructor (teaching fellow) and teaching assistant, with an emphasis on laboratory-based learning.

- Responsible for online and in-person course delivery and management of faculty, staff, and teaching assistants
- Developed policy recommendations for the use of anti-plagiarism software based on working experience
- Transitioned course to online-only submissions using digital learning platform
- Redesigned course content and optimized scheduling to improve staff efficiency and learner experience

Real Estate Rental Manager

2008 – 2018

Self-employed – Guelph, ON and Kingston, ON

Improved, managed, and maintained two owner-occupied residential rental properties for students.

- Undertook major renovations in accordance with residential building codes
- Drafted and executed detailed rental contracts to protect all parties
- Advertised for and interviewed prospective tenants
- Analysed local market to maximize return on improvement spending resulting in increased rental inquiries

Vice President

2015 – 2016

Society of Graduate and Professional Students – Kingston, ON

Elected Vice President of the Board of Directors of non-profit graduate student society with \$2,000,000+ annual budget, representing 4000 students. Became the only candidate to defeat an incumbent in over 30 years.

- Collaborated with executive team to draft, debate, and establish new bylaws and policies
- Initiated complete organizational risk and insurance audit and took steps to remedy gaps identified in coverage strategy
- Negotiated with and advised university administrators on allocation of more than \$11,000,000 in funding
- Instituted operational structure changes for internal programs to reduce costs based on analysis of usage data
- Oversaw peer support program including hiring, staff training programs, and strategic direction
- Developed long-term IT strategy and managed website; moved organization from on-premise hosting to Microsoft 365 cloud to manage staff workload

Assistant Coach (Swimming)

2011 – 2012

Athletics and Recreation – Queen’s University

Appointed Assistant Coach of the varsity swim team after 5 years of competing on the team (3 years as team captain). Responsible for team building, strength training, on-deck coaching support, and community engagement.

- Established partnership between university and local swim club leading to resource sharing and cost savings
- Maintained records of athlete progress and performances and facilitated athlete goal setting
- Collaborated with local high school to develop swim clinics, encourage team learning, and promote youth development

Assistant Engineering Researcher

2010

Explosion Physics and Prevention Laboratory – Queen’s University

Investigated high-speed combustion behaviour of hydrogen and methane in porous media beds.

- Developed LabVIEW program to trigger and synchronize data collection using high-speed sensors and cameras
- Established standard operating procedures for safe operation of experimental equipment

TECHNICAL SKILLS

- Significant machine shop, fabrication, and prototyping experience including welding, 3D printing, and CNC machines
- Expertise of construction methods, including residential building standards for structure, plumbing, and electrical
- Extensive knowledge of computer hardware, networking, and systems support
- Experience with a wide range of software packages in the context of engineering research including:
 - Lightroom
 - Photoshop
 - SolidEdge/SOLIDWORKS
 - TecPlot
 - LaTeX
 - Illustrator
 - MATLAB/Python/BASH
 - LabView
 - ParaView
 - OpenFOAM

INTERESTS

- Sports and health: competitive swimmer for 15 years, running, cycling, soccer, travelled on foot 4000+ km in 2021
- Technology: server hardware, sports tech, home automation, electronics
- Design and construction: home renovation, modern architecture, modular/prefabricated housing, furniture building
- Energy and environment: energy storage, carbon-free sources, hydrogen energy