18 White St., Apt. 3
Cambridge, MA 02140

Alexis Maguin Fenton, Jr.

Analytical electrochemist

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+1 (210) 332-3825

Education

Massachusetts Institute of Technology, Cambridge, MA (2016-present)
Ph.D. Candidate, Chemical Engineering, *Brushett Research Group* (**GPA: 4.9/5.0**)
Proposed Thesis Title: Combining Inference and Modeling to Extend the Capabilities of Analytical Electrochemistry
Minor: Inference and Machine Learning
Certificates: Kaufman Teaching Certificate, issued 2020
Masters of Science in Chemical Engineering Practice, received 2018 (**GPA: 4.9/5.0**)

Rice University, Houston, TX (2012-2016)
Bachelors of Science in Chemical Engineering, *Magna Cum Laude*, received 2016 (**GPA: 4.04/4.33**)
Focus within Chemical Engineering major: Materials Science and Engineering

Professional Experience

Massachusetts Institute of Technology, Chemical Engineering; Cambridge, MA
Graduate Research Assistant, *Brushett Research Group*; January 2017-present
- Demonstrate that probabilistic inference and modeling can enhance voltammetric analysis
- Design a modified battery architecture to increase operational flexibility
- Characterize electrochemical systems *via in situ* (e.g., voltammetry) and *ex situ* (e.g., NMR, XRD) analyses

Royal Dutch Shell; Houston, TX
Technical Consulting Intern, MIT Practice School; August 2017-October 2017
- Evaluated approaches for integration of renewables into common processes (e.g., electrification)
- Consulted with expert scientists and presented findings to the company

Emirates Global Aluminium (EGA); Dubai, United Arab Emirates
Technical Consulting Intern, MIT Practice School; October 2017-December 2017
- Assessed plant processes to potentially save millions of $ USD and to estimate greenhouse gas emissions
- EGA presented a fraction of this work at the 37th Conference and Exhibition of The International Committee for Study of Bauxite, Alumina, and Aluminium (ICSOBA) in Krasnoyarsk, Russia

Scholarly Publications

J. A. Kowalski, **A. M. Fenton, Jr.**, B. J. Neyhouse. F. R. Brushett, *A Method for Evaluating Soluble Redox Couple Stability Using Microelectrode Voltammetry*, Journal of The Electrochemical Society, **167**, 160513, 2020

B. J. Neyhouse, **A. M. Fenton, Jr.**, F. R. Brushett, *Too much of a good thing? Assessing performance tradeoffs of two-electron compounds for redox flow batteries*, Journal of The Electrochemical Society, in press

M. A. Jawi, E. A. Obaidli, R. Natesan, S. Pollé, M. Mahmoud, K. Williams, **A. Fenton**, and A. Wu, *Carbon Monoxide Emissions from Electrolysis Process in EGA Smelters*, 37th Conference and Exhibition of ICSOBA, 2019

A. M. Fenton, Jr., F. R. Brushett, *Chemical Identification in Multicomponent Electrolytes using Voltammetry, Physics-Based Modeling, and Bayesian Inference*, in prep (expected submission: April 2021)

A. M. Fenton, Jr., B. J. Neyhouse, K. M. Tenny, Y. M. Chiang, F. R. Brushett, *Simplifying Microelectrode Voltammetry through Closed-Form and Finite-Difference Modeling in Oblate Spheroidal Coordinates*, in prep

Technical Presentations

A. M. Fenton, Jr., B. J. Neyhouse, K. M. Tenny, Y. M. Chiang, and F. R. Brushett, *Analytical and Numerical Modeling of Microelectrode Voltammetry in Oblate Spheroidal Coordinates*, 239th Electrochemical Society Meeting, Chicago, IL (virtual). May-June 2021

A. Fenton Jr., F. Brushett, *Using voltammetry augmented with physics-based modeling and Bayesian hypothesis testing to estimate electrolyte composition*, Battery Modeling Webinar Series 3-Minute Thesis Day, Cambridge, MA (virtual). April 2021

A. Fenton Jr., F. Brushett, *Combining Experiment, Physics-Based Modeling and Bayesian Inference to Enhance Voltammetric Characterization*, 2020 Virtual MRS® Spring/Fall Meeting and Exhibit, Boston, MA (virtual). November-December 2020

A. Fenton Jr., F. Brushett, *Automating Electroactive Compound Identification to Simplify Electrolyte Decay Analysis in Energy Storage Devices*, 2020 MIT A+B Applied Energy Symposium, Cambridge, MA (virtual). August 2020

A. M. Fenton Jr., F. Brushett, *Combining Cyclic Square Wave Voltammetry Experiment and Modeling to Quantify Unknown Electron Transfer Mechanisms for Applications in Relevant Electrochemical Systems*, 236th Electrochemical Society Meeting, Atlanta, GA. October 2019

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Teaching and Mentorship Experience

Kaufman Teaching Certificate Program, Cambridge, MA
Participant, MIT Teaching + Learning Lab; certificate issued December 2020

- Studied proven practices and philosophies in instruction to develop teaching skills
- Designed modules for an electrochemistry class (e.g., constructing a syllabus, formulating exam questions)
- Constructed and taught a short demo lesson on electrochemistry thermodynamics to fellow participants

Teaching Assistant (Graduate Chemical Reactor Engineering), Cambridge, MA
MIT, Department of Chemical Engineering; January 2020-May 2020

- Ranked highly by first-year graduate students (mean 5.8/7, standard deviation of 1.04)
- Developed content for recitations, and drafted both problem sets and exams
- Responded to the COVID-19 pandemic by helping transition the class to an accessible and exclusively online format

Graduate Student Mentor, Cambridge, MA
MIT, Brushett Research Group; November 2020-present

- Guide a younger graduate student to become familiar with a field of study
- Teach electrochemistry fundamentals and counsel in experimental and research design

Undergraduate Research Opportunities Program (UROP) Mentor, Cambridge, MA
MIT, Brushett Research Group; June 2019-October 2020

- Communicated research goals and concepts to 2 undergraduate students so they could contribute to project progression
  - Both will be offered contributing authorship on a future paper
- Crafted funding proposals within MIT; one student secured UROP Direct Funding
- Pivoted ongoing experimental research to a remote modeling project in response to the COVID-19 pandemic

Academic Fellow, Rice University, Houston, TX
McMurtry Residential College, 2014-2016

- Tutored students in organic chemistry, both individually and in larger groups

Service and Leadership Experience

ChemE Application Mentorship Program Mentor, Massachusetts Institute of Technology, Cambridge, MA
Department of Chemical Engineering, September 2020-November 2020

- Aided an undergraduate student of an underrepresented group with his MIT ChemE graduate school application
- Critically revised various application materials and offered advice over synchronous video calls

Vice-President of Residential Life, Massachusetts Institute of Technology, Cambridge, MA
Sidney Pacific Graduate Residence Executive Council, May 2018-May 2019

- Managed and oversaw 14 officers in charge of organizing events for Sidney Pacific residents
- Wrote successful proposals to MIT-wide funding sources (e.g., Graduate Student Council) for large events (300+ people)
- Communicated with other members of the Executive Council and Heads of House on a weekly basis

NetPals Program Mentor, Cambridge School Volunteers, Inc., Cambridge, MA
Massachusetts Institute of Technology, January 2018-May 2018

- Coached and provided scientific guidance to a seventh-grade Cambridge public school student for his class project

Honors and Awards

- Dow Travel Award Recipient (2019) – competitive travel grant awarded within MIT's Chemical Engineering department
- MIT Presidential Fellow (2016-2017)
- Phi Beta Kappa Honor Society (inducted 2016)
- Tau Beta Pi Engineering Honor Society (inducted 2015)
- American Chemical Society Scholar (2013-2016)
- McMurtry Residential College Outstanding Senior Award (2016)
- T.W. Moore Scholarship (2015) – awarded to the top six rising seniors by GPA in the Rice Chemical Engineering major
- Princeton Engineering Graduate Symposium (2015) – travel award from Princeton
- L.J. Walsh Scholarship (2015)
- Houston Gas Processors Association Scholarship (2015)
- Fluor Daniel Engineering Scholarship (2015)
- 2013-2014 Donald F. Othmer Sophomore Academic Excellence Award (2014)
- Rice Trustee Brown Scholarship (2012-2016)