

# ANDREW LAMARCHE

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## CANDIDATE SUMMARY

### AREAS OF EXPERTISE

Electrochem. Devices • PEM Electrolysis • PEM Fuel Cells • High Pressure Gas • Flow Batteries  
Simulation • Functional Safety • P&ID • Fault Management • DFMEA • MBSE • Process Control  
Requirements • Verification • Testing • Systems Integration • IEC 13849 • ISO 26262

### ENGINEERING SOFTWARE & PROGRAMMING

Python • Go • TypeScript • JavaScript • svn • git • SQL • VSCode Ext. • Matlab • COMSOL  
DWSIM • OpenModelica /Simulink • Aspen Plus • Panasonic FPO • Capella (MBSE)

## EXPERIENCE

### **NUVERA FUEL CELLS | MANAGER, SYSTEMS DEVELOPMENT**

November 2019 - Present | Billerica, MA

- Architected, developed, and lead "EngineCalc" project - a Python module adding new capabilities and unit operations that expand existing process modelling software to simulate and understand candidate engine designs from a variety of viewpoints.
- Developed domain-specific-language servers and applications to accelerate completion of common tasks (e.g. data visualization, routine report generation)
- Developed and communicated thermal system simulations to design fuel cell engines compatible with typical automotive constraints and high voltage architectures
- Developed requirements and re-architected engine control software to support distributed collaboration and FuSa design aspects (among other system viewpoints and SW missions)
- Managed teams of up to 8 engineers in the development of several new fuel cell engine products and platforms from project genesis to pre-production. Developed engineers to successfully complete requirements and test deliverables, and electrical subsystem designs.
- Transitioned systems engineering organization away from manual document-based approach toward an MBSE and database-focused approach.

### **NUVERA FUEL CELLS | LEAD SYSTEMS ENGINEER**

April 2018 - November 2019 | Billerica, MA

- Lead systems engineer for Nuvera's fuel cell engines, generating and managing technical product requirements, proposing system/subsystem architecture based on trade studies and internal/external stakeholder inputs.
- Rearchitected engine control software fault management strategy to comply with standards and expectations across a broad section of target markets.
- Championed development of engine reliability growth campaigns and drove development of test infrastructure, leveraging results to improve service and reliability metrics.
- Trained design engineers on codes/requirements allocated to their subsystems/interfaces, leading HARA/DFMEA activities, and verification campaigns.
- Collaborated with applications to roadmap design improvements against future iterations.

## **NEL HYDROGEN | ELECTROCHEMICAL ENGINEER**

May 2014 - April 2018 | Wallingford, CT

- Design lead for mechanical balance-of-plant, electrical, and controls subsystems of prototype R&D systems, inclusive of CO<sub>2</sub> electrolyzers, differential pressure water electrolyzers, and safety-critical halogen-hydrogen flow batteries.
- Performed studies for HALE UAVs trading unitized/discretized, distributed/central fuel cell powertrains against flight duration, take-off mass, and physical dimensions
- Wrote or contributed to SBIR/STTR reports for NASA, USDA, NSF, ARPA-E.
- Modified an existing commercial PEM water electrolysis stack design to implement a proof-of-concept continuous electrodeionization process.
- Contributed to megawatt-scale water electrolyzer product designs by sizing equipment and justifying sized safety equipment against selected codes and standards.
- Automated formerly manual analyses of field service datasets in Python to identify areas for system reliability growth while saving company resources.
- Tested 3ksi oxygen and 5ksi differential pressure hydrogen and oxygen systems. Gained understanding of oxygen-cleaning procedures and contributed to design of 5ksi hydrogen systems

## **UNIVERSITY OF CONNECTICUT | RESEARCH ASSISTANT**

January 2012 - August 2013 | Storrs, CT

- Performed testing and developed Python/VBA scripts for multivariate analysis of chemiresistive sensor array data.
- Contributed to two peer-reviewed publications regarding novel chemiresistive vapor sensors.

## **EDUCATION**

### **UNIVERSITY OF CONNECTICUT | B.S. CHEMICAL ENGINEERING**

May 2014 | Storrs, CT | GPA 3.8/4.0 | Minor - Materials Science & Engineering

Focus: Process Simulation, Surface Reactions & Catalysis, Electrochemical Devices

## **PUBLICATIONS**

- K. Fu et al., "Polynucleotide-functionalized gold nanoparticles as chemiresistive vapor sensing elements," *SENSORS*, 2013 IEEE, 2013, pp. 1-4, doi: 10.1109/ICSENS.2013.6688518.
- (Acknowledged) K. Fu et al., "DNA Gold Nanoparticle Nanocomposite Films for Chemiresistive Vapor Sensing". *Langmuir* 2013 29 (46), pp. 14335-14343. DOI: 10.1021/la402626p