

# TRAVIS JOSEPH KESSLER

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Graduate student with 4 years of experience in academic research and open source software development. Confident in directing teammates and students as a project manager and teaching assistant. Capable of communicating across numerous scientific, engineering and business disciplines. Achievements include developing machine learning models to predict molecular properties with 34% more accuracy than historical average. Skilled in applied machine learning, data mining/pipelining, statistics, and software engineering development/management.

## TECHNICAL SKILLS

<i>Software Languages</i>	<i>Software Tools</i>	<i>Software Environments</i>	<i>Working Environments</i>
* Python, C, C++	* TensorFlow, Keras	* Azure Web Services	* AGILE/SCRUM
* Javascript, HTML, CSS	* Scikit-Learn	* Amazon Web Services	* DevOps Lifecycle
* SQL	* Matplotlib	* Windows Server 2012+	* Kanban Organization
* Bash/Shell	* Git, SVN	* Linux (Headless, GUI)	* MRPT DoJ Clearance

## EDUCATION

### **PhD Computer Engineering – GPA 3.93**

*University of Massachusetts Lowell*  
May 2024 (Expected)

### **BS Computer Engineering – GPA 3.56**

*University of Massachusetts Lowell*  
May 2018

## EXPERIENCE

### **Graduate Research Assistant**

*Jan. 2019 – Present*

*University of Massachusetts Lowell Energy and Combustion Research Laboratory*

- \* Leverages predictive models, including state-of-the-art machine learning models, to advance alternative fuel research
- \* Investigates methods for feature selection and hyper-parameter tuning, including random forest trees, principal component analysis, genetic algorithms and artificial bee colonies
- \* Manages a team of undergraduate computer science/engineering students in tasks related to current research efforts
- \* Funded by the U.S. Department of Energy under award DE-EE0008479 as part of the Co-Optimization of Fuels & Engines (Co-Optima) project

### **Technical Operations/DevOps Engineer**

*June 2018 – Jan. 2019*

*Valora Technologies*

- \* Utilized data mining techniques to extract client-specified information from legal, financial and government documents
- \* Constructed data pipelines to usher client documents from intake to delivery of extracted information
- \* Trained newly hired DevOps engineers in data pipelining/mining workflow configuration
- \* Obtained Moderate Risk Public Trust (MRPT) Department of Justice (DoJ) security clearance

### **Undergraduate Research Assistant**

*June 2015 – May 2018*

*University of Massachusetts Lowell Energy and Combustion Research Laboratory*

- \* Optimized predictive models to predict chemical reaction properties based on molecular structure (QSAR/QSPR)
- \* Implemented optimal neural network architectures to multidimensional input and output (training) data
- \* Developed open source machine learning, feature extraction and hyper-parameter tuning software packages
- \* Published research efforts in The Journal of Open Source Software, Fuel, and the American Society of Mechanical Engineers Internal Combustion Engine Fall Conference

## **SELECTED AWARDS & HONORS**

1 <sup>st</sup> place, Symbotic Warehouse Robot Prototyping Competition	May 2018
Innovative Technology Solution, UMass Lowell DifferenceMaker 50K Idea Challenge	April 2017
1 <sup>st</sup> place, Francis College of Engineering Prototyping Competition	Dec. 2016
UMass Lowell Francis College of Engineering Dean's Scholarship	Sep. 2014

## **PUBLICATIONS & PRESENTATIONS**

- P8. **Travis Kessler**, Thomas Schwartz, Hsi-Wu Wong, John Hunter Mack. "Screening Compounds for Fast Pyrolysis and Catalytic Biofuel Upgrading Using Artificial Neural Networks". *ASME Internal Combustion Engine Division Fall Technical Conference* (2019). <https://doi.org/10.1115/ICEF2019-7170>
- P7. Sanskriti Sharma, Hernan Gelaf-Romer, **Travis Kessler**, John Hunter Mack. "ECabc: A feature tuning program focused on Artificial Neural Network hyperparameters". *Journal of Open Source Software* (2019). <https://doi.org/10.21105/joss.01420>
- P6. John Hunter Mack, **Travis Kessler**. "A Computational Approach to Screening Alternative Fuel Candidates". *New England Energy Research Forum* (2019).
- P5. **Travis Kessler**, Eric Sacia, Alexis Bell, John Hunter Mack. "Artificial neural network based predictions of cetane number for furanic biofuel additives". *Fuel*, 206, 171-179 (2017). <https://doi.org/10.1016/j.fuel.2017.06.015>
- P4. **Travis Kessler**, Gregory Dorian, John Hunter Mack. "Application of a Rectified Linear Unit (ReLU) Based Artificial Neural Network to Cetane Number Predictions". *ASME Internal Combustion Engine Division Fall Technical Conference* (2017). <https://doi.org/10.1115/icef2017-3614>
- P3. **Travis Kessler**, John Hunter Mack. "ECNet: Large scale machine learning projects for fuel property prediction". *Journal of Open Source Software* (2017). <https://doi.org/10.21105/joss.00401>
- P2. **Travis Kessler**, Eric Sacia, Alexis Bell, John Hunter Mack. "Predicting the Cetane Number of Furanic Biofuel Candidates Using an Improved Artificial Neural Network Based on Molecular Structure". *ASME Internal Combustion Engine Division Fall Technical Conference* (2016). <https://doi.org/10.1115/icef2016-9383>
- P1. **Travis Kessler**, John Hunter Mack. "Predicting Biofuel Properties with an Artificial Neural Network". *UMass Lowell Student Research and Engagement Symposium* (2016).

## **TECHNICAL COMMUNICATIONS**

Google Scholar: [Travis Kessler](#)

GitHub: <https://github.com/tjkessler>

LinkedIn: <https://www.linkedin.com/in/traviskessler/>