

TRAVIS JOSEPH KESSLER

University of Massachusetts Lowell
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Graduate student with more than 5 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 the historical average. Skilled in applied machine learning, data mining/pipelining, statistics, and software engineering development/management.

TECHNICAL SKILLS

Software Languages

- * Python, C, C++
- * Javascript, HTML, CSS
- * SQL/NoSQL
- * Bash/Shell

Software Tools

- * TensorFlow, Keras
- * PyTorch, Scikit-Learn
- * MongoDB
- * Git, SVN

Software Environments

- * Azure Web Services
- * Amazon Web Services
- * Windows Server 2012+
- * Linux (Headless, GUI)

Working Environments

- * AGILE/SCRUM
- * DevOps Lifecycle
- * Kanban Organization
- * MRPT DoJ Clearance

EDUCATION

PhD Computer Engineering – GPA 3.78

University of Massachusetts Lowell
May 2023 (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
- * Published research efforts in *The Proceedings of the Combustion Institute*, *The Journal of Open Source Software*, and the *American Society of Mechanical Engineers Internal Combustion Engine Fall Conference*
- * Funded by the U.S. Department of Energy under award DE-EE0008479 as part of the Co-Optimization of Fuels & Engines (Co-Optima) project

Graduate Teaching Assistant

Jan. 2019 – Present

University of Massachusetts Lowell Department of Electrical and Computer Engineering

- * Directs undergraduate students in a laboratory setting, supervising curriculum instruction, performing one-on-one assistance/troubleshooting, and administering/grading course material
- * Confers with laboratory supervisor to formulate efficient methods of course material delivery and laboratory management
- * Course repertoire includes Circuits I, Circuits II, Electronics I, and Electronics II

Technical Operations/DevOps Engineer

June 2018 – Jan. 2019

Valora Technologies

- * Used 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

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*

TECHNICAL COMMUNICATIONS

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

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

SELECTED AWARDS & HONORS

Best Presentation, ASME ICEF 2019 Conference	Oct. 2019
1 st place, Symbiotic Warehouse Robot Prototyping Competition	May 2018
Innovative Technology Solution, UMass Lowell DifferenceMaker 50K Idea Challenge	April 2017
1 st place, Francis College of Engineering Prototyping Competition	Dec. 2016

PUBLICATIONS

- PB8. **Travis Kessler**, Thomas Schwartz, Hsi-Wu Wong, J. Hunter Mack. "Predicting the Cetane Number, Yield Sooting Index, Kinematic Viscosity, and Cloud Point for Catalytically Upgraded Pyrolysis Oil Using Artificial Neural Networks". *ASME Internal Combustion Engine Division Fall Technical Conference* (2020). <https://doi.org/10.1115/ICEF2020-2978>
- PB7. **Travis Kessler**, Peter C. St. John, Junqing Zhu, Charles S. McEnally, Lisa D. Pfefferle, J. Hunter Mack. "A comparison of computational models for predicting yield sooting index". *Proceedings of the Combustion Institute* (2020). <https://doi.org/10.1016/j.proci.2020.07.009>
- PB6. **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>
- PB5. 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>
- PB4. **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>
- PB3. **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>
- PB2. **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>
- PB1. **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>

PRESENTATIONS

- PR3. **Travis Kessler**, Corey Hudson, Leanne Whitmore, John Hunter Mack. "Prediction of Research/Motor Octane Number and Octane Sensitivity Using Artificial Neural Networks". *Eastern States Section of the Combustion Institute Spring Technical Meeting* (2020).
- PR2. John Hunter Mack, **Travis Kessler**. "A Computational Approach to Screening Alternative Fuel Candidates". *New England Energy Research Forum* (2019).
- PR1. **Travis Kessler**, John Hunter Mack. "Predicting Biofuel Properties with an Artificial Neural Network". *UMass Lowell Student Research and Engagement Symposium* (2016).