TRAVIS JOSEPH KESSLER

University of Massachusetts Lowell
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Graduate student with more than six 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	Software Tools	Software Environments	Working Environments
* Python, C, C++	* TensorFlow, Keras	* Azure Web Services	* AGILE/SCRUM
* Javascript, HTML, CSS	* PyTorch, Scikit-Learn	* Amazon Web Services	* DevOps Lifecycle
* SQL/NoSQL	* MongoDB	* Windows Server 2012+	* Kanban Organization
* Bash/Shell	* Git, SVN	* Linux (Headless, GUI)	* MRPT DoJ Clearance

EDUCATION

PhD Computer Engineering – GPA 3.81	**BS Computer Engineering – GPA 3.56**
University of Massachusetts Lowell	*University of Massachusetts Lowell*
May 2023 (Expected)	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*
1st place, Symbotic Warehouse Robot Prototyping Competition   *May 2018*
Innovative Technology Solution, UMass Lowell DifferenceMaker 50K Idea Challenge   *April 2017*
1st 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).