Geoffrey Aaron Converse

I am a fourth year PhD candidate in the Applied Mathematical and Computational Sciences program at the University of Iowa, and am advised by Dr. Suely Oliveira. My research interests include Educational Data Mining, Machine Learning, Data Science, and Numerical Analysis. Most recently, I have worked on developing parameter estimation techniques in Item Response Theory using Variational Autoencoders, a class of neural networks.

Peer Reviewed Publications

- Converse, Curi, Oliveira. "Variational Autoencoders for Baseball Player Evaluation." In Proceedings of the Fuzzy Systems and Data Mining Conference (FSDM), 2019.
- Converse, Curi, Oliveira. "Autoencoders for Educational Assessment." In Proceedings of the Conference on Artifical Intelligence in Education (AIED), 2019.
- Curi et. al. "Interpretable Variational Autoencoders for Cognitive Models." In Proceedings of the International Joint Conference on Neural Networks (IJCNN), 2019.
- Jiang et. al. "Efficient Nonmyopic Active Search." In Proceedings of the 34th International Conference on Machine Learning (ICML) in PMLR 70:1714-1723. August 2017, Sydney, Australia.

Software and Presentations

- Converse, Geoffrey. "ML2Pvae: Variational Autoencoder Models for IRT Parameter Estimation." **R** package version 1.0.0. CRAN, 2020. https://CRAN.R-project.org/package=ML2Pvae
- Bruns et. al. "Modeling the Spread of Palmer Amaranth in Iowa." Iowa Soybean Association Farmer Research Conference, 7 February 2018, Des Moines, Iowa.
- Converse, Grove, Pape. "Maximizing Potential in a Fantasy Football Draft." Presented at Joint Mathematics Meetings (JMM), 11 January 2015, San Antonio, Texas.

Service

Fall 2020	**GPSG Grant Reviewer** UI Graduate and Professional Student Government
Spring 2020	**Graduate Student Mentor** Iowa Mathematics Directed Reading Program

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Awards and Fellowships

Fall 2020	**Post-Comprehensive Research Fellowship** University of Iowa Graduate College
Summer 2019	**AMCS Summer Merit Fellowship** University of Iowa Department of Mathematics
Summer 2018	**AMCS Summer Merit Fellowship** University of Iowa Department of Mathematics
Summer 2017	**Palmer Project Fellow** Simpson College Palmer Amaranth Research
Summer 2016	**NSF REU Fellow** Washington University in St. Louis
Summer 2014	**Bryan Summer Research Fellow** Simpson College Department of Mathematics

Education

Period	**August 2017 — Current**	
Degree	**PhD (candidate) in Applied Mathematical and Computational Sciences** **Master of Science in Mathematics** **Master of Science (candidate) in Computer Science**	
Adviser	**Suely Oliveira, Department of Computer Science**	
University	**The University of Iowa**	Iowa City, Iowa

Period	**August 2013 — May 2017**	
Degree	**Bachelor of Arts in Mathematics** **Bachelor of Arts in Computer Science** **Minor in History**	
Honors	**Summa Cum Laude, Epsilon Sigma Honor Society**	
GPA	**3.98**	
University	**Simpson College**	Indianola, Iowa

Industry Work Experience

Period	**Summer 2020**
Employer	**ACT, Inc.**
Position	**Machine Learning Intern**

I worked in the AI/ML research group at ACTNext on a Knowledge Tracing problem, where the goal is to estimate student's concept mastery as they progress through an assessment. Our approach involved using Transformers, a neural network architecture designed for natural language processing. This work was done in Python, using the Tensorflow library.

Period	**Summer 2015**	
Employer	**John Deere Intelligent Solutions Group**	Moline, Illinois
Position	**Software Development Intern**	

As an intern at John Deere ISG in Moline, Illinois, I was part of a team that developed a debugging and support tool for an application used in agricultural equipment. I programmed in Scala and HTML, and used MongoDB to access necessary information.

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Teaching

Spring 2020	**MATH 1550**: Calculus for Engineers, Virtual TA
Fall 2019	**MATH 1560**: Multivariable Calculus, Grading TA
Spring 2019	**MATH 1850**: Calculus I, TA
Fall 2018	**MATH 1460**: Calculus for the Biological Sciences, Lead TA
Spring 2018	**MATH 1460**: Calculus for the Biological Sciences, Lead TA
Fall 2017	**MATH 1460**: Calculus for the Biological Sciences, TA
2016 — 2017	**Mathematics Tutor**, Simpson College

Skills

Preferred Programming Languages	Python, R, MatLab
Databases	MongoDB, SQL
Other	LaTeX, Vim, Git

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