Taylor Olson

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Education

Northwestern University, Evanston, IL

PhD Computer Science, 2018 - Present

M.S. Computer Science, 2018 - Present

University of Northern Iowa, Cedar Falls, IA

B.S., Computer Science, 2018

B.A., Mathematics, 2018

Minor in Philosophy

Kirkwood Community College, Cedar Rapids, IA

Mechanical Engineering, 2014

Research Interests

My main research interests lie at the intersection of artificial intelligence and philosophy, specifically among methods of natural language text processing (NLP) and decision making.

Probabilistic Methods for NLP

Machines must have a means to handle the ambiguities of language. I am interested in advanced probabilistic methods of understanding and response generation. Furthermore, creating tractable methods of predicting where a conversation is heading, based on current and previous knowledge/conversations.

Maintaining Context

Humans rarely struggle to maintain the context of a conversation as it unfolds. However, due to space/time complexities and many other factors, machines have a hard time preserving this information. I am interested in exploring models used for the storage and retrieval of necessary contextual information during conversation. Models consisting of more simple structures, such as stacks, as well as more advanced models involving deep learning.

Concept Learning and Causal Reasoning

While interacting in the world, humans quickly generate and store many categorical and causal relationships. Due to the same problems of complexity stated above, it is difficult to design machines capable of performing this same task. Thus, I am interested in modeling human's ability to build and recall these categorical and causal relationships. I am specifically interested in investigating methods for building logical connections and making inferences from both boolean and probabilistic valued functions.

Machine Ethics

I am currently exploring computational methods of modeling ethics in hopes of eventually representing a moral code to be used by intelligent systems.

Professional and Research Experience

Research Intern, Harvard University, Computational and Applied Mathematics team, NSF Grant, Summer 2017

Research Assistant, University of Northern Iowa, Bioinformatics, 2016-2017

Programming Intern, Web and Software Development, VGM Forbin, Summer 2016

Presentations

Artificial Intelligence in Curriculum Design, National Conference for McNair Scholars and Undergraduate Research, University of Maryland, March 2018

Invited Speaker, *Artificial Intelligence and Recommender Systems*, McNair Seminar Series, University of Northern Iowa, September 2017

Recommendation System Developer, Joint Research Experience for Undergraduates Summer Symposium, Harvard University, August 2017

Honors and Awards

Cognitive Science Fellowship, Northwestern University, 2018

4th Place, Midwest Instruction and Computing Symposium Programming Contest, 2017

1st Place at site, ACM Programming Contest, 2016

Ronald E. McNair Postbaccalaureate Achievement Program, 2016

Student of the Month, Kirkwood Community College, 2014

Engineering project featured in local newspaper, 2012

All-Region Basketball, Kirkwood Community College, 2012-2014

Software

tRECS

Python NLP package and graphical interface for cleaning text data, building various statistical and vector space models, and creating recommender systems, with Janie Neal, Christiana Prater-Lee, and Eshita Nandini

UMLS-Similarity-Viewer

Python package for graphical user interface to UMLS-Similarity, a similarity querying package built on top of the UMLS database of medicines, chemical compounds, and adverse drug reactions