[EECS-Faculty] Defense Announcement—Tabitha Samuel

Defense Announcement

Student: Tabitha Samuel
Date: March 26, 2025
Time: 3:00 pm
Location: MKB 435

Committee Members

- Michael W. Berry - EECS (Chair)
- Dr. Amir Sadovnik - EECS
- Dr. Audris Mockus - EECS
- Dr. Jillian McCarthy, Department of Audiology and Speech Pathology, The University of Tennessee Health Science Center.

Thesis Title: Using Human Interaction with Natural Language Processing Techniques to Reinforce Vocabulary Comprehension and Usage

Abstract
This dissertation proposes SENCE: SENtence Curation and Evaluation - a Natural Language Processing (NLP) aid to be used in an educational setting for children. SENCE is designed as an AI-augmented tool for educators, such as general and special education teachers and practicing school-based speech-language pathologists who work with children. SENCE will be particularly useful for children with developmental language disorders or hearing impairment. While several commercially available products incorporate NLP techniques for teaching adults language skills, the field is still nascent for incorporating NLP into teaching aids for children. SENCE uses NLP techniques to reinforce vocabulary comprehension and usage in children. Additionally, it integrates human interaction with NLP techniques, allowing domain specialists to improve results before they are presented to students. SENCE uses off-the-shelf NLP libraries such as spaCy and Stanza in combination with NLP techniques such as lemmatization, part-of-speech tagging, and vocabulary similarity. These methods are integrated to identify key vocabulary words and sentences using those keywords. An evaluation is created based on these keywords and sentences. SENCE creates an automated process to gauge students' vocabulary comprehension over time. The evaluations can be shared between classes and instructors. Further, students can be quickly assessed for retention of words taught earlier in the school year. Through these methods, SENCE provides a novel and easy-to-use NLP-powered application for non-computer scientists to leverage NLP in everyday classroom tasks.

Student Biography
Tabitha Samuel is the Interim Director and HPC Operations Group Leader at the National Institute for Computational Sciences, University of Tennessee, Knoxville. She has over 15 years of experience in advanced research computing, ranging from user support and systems programming to executing and enhancing the overall vision and mission of a nationally recognized supercomputing center. An active Research Computing and Data (RCD) community member, Tabitha is co-PI of the Building Research Innovation at Community Colleges (BRICCs)-Pathways and BRICCs-Research Data Management NSF projects, focusing on collaborative CI advancement and data management at BRICCs member sites. She is also the co-founder of TN-RCD, a platform for collaboration and regional advancement in CI for RCD professionals in Tennessee. More information can be found at: https://www.linkedin.com/in/tabithasamuel/.