



Intelligent Tutoring System Using Reinforcement Learning for Students with Autism Spectrum Disorder

- Amulya Yadav, College of Information Sciences and Technology
- Jonte Taylor, College of Education
- Fei Fang, Carnegie Mellon University

Abstract: Due to their socialization and communication difficulties, young children with autism spectrum disorder (ASD) face many challenges in traditional school environments. Intelligent tutoring systems (ITS) are a promising technology for supplementing instruction for children with ASD. However, previous work in the design of such systems often does not consider crucial cognitive features of students, such as working memory deficits and the zone of proximal development (ZPD), etc. Furthermore, these systems are frequently not tailored for use by children with ASD, potentially causing significant shortcomings in the effectiveness of their learning. Building on top of our prior work, we propose to develop a Reinforcement Learning based ITS for teaching children with ASD by: (i) collecting data from 100 K-12 students suffering from ASD using a tablet-based software application; (ii) using the collected data to learn a parametrized student model, which represents learning behavior of students with ASD; (iii) use this student model with deep RL techniques to design an adaptive tutoring policy for teaching emotion recognition to students with ASD; (iv) piloting our RL based ITS with 100 K-12 students in Pennsylvania to evaluate its effectiveness.