RESEARCH

ADAPTING TO
MACHINE LEARNING

Dr. Hamid Nemati, professor of Information Systems and Supply Chain Management at UNC Greensboro's Bryan School of Business and Economics, has been studying Artificial Intelligence (AI) for longer than most.

While pursuing his PhD at the University of Georgia, Nemati did his dissertation on using AI methods to optimize flows in networks. His interest in AI only grew stronger after his arrival at the Bryan School and has hit a fever pitch as advances in AI technologies, including ChatGPT, have made them more widely used.

One research project that Hamid and his research team have been excited about is on using AI methods to mitigate child abuse and maltreatment. "As AI technologies have moved forward and it has become possible to apply them to areas that we didn't think applicable before," said Nemati.

Their research in this area culminated in a seminal work "An Adaptive Machine Learning System for predicting recurrence of child maltreatment: A routine activity theory perspective" published in the prestigious journal of Knowledge-Based Systems. Nemati's team tasked itself with developing a robust AI system that could help predict child abuse using a well-known dataset.

"We want to do a large-scale implementation of the system and want different agencies to use the system and get their feedback," he said. "So, what we're trying to get is get a better a sense of how these systems can become part of the daily routine for child protective agencies."

For this project, Hamid and his colleagues – including former doctoral students Dr. Minoo Modaresnezhad and Dr. Yuzhang Han – used nationally known data the U.S. government began collecting in the 1990s that was curated by Cornell University. The data includes detailed information about reported child abuse down to the zip code. Hamid says those in the AI space have a high interest in this type of structured, detailed data collected over a prolonged period.

Describing it as a tragic national epidemic, Hamid said he was heartbroken to see the number of child abuse cases. He is elated, however, at the prospect that his research could help mitigate the problem, and that his principal coauthors had previously been his Phd students.

As far as what's next, Hamid has his sights set on solving the bias problem in AI. The data from this recent project was riddled with racial, ethnic and socio-economic bias, he says, a trend that is a well-documented result of systemic and structural racism and bias. "This bias is reflected in data collection and reporting is problematic and must be dealt with before the data can be used for training AI systems," he said.

Dr. Hamid Nemati
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