ARTIFICIAL INTELLIGENCE METHODS AND APPLICATIONS (AIMA)

AIMA 430: AI Capstone I: Project Design

3 Credits

Artificial Intelligence (AI) is an interdisciplinary field concerned with the study of computational models of intelligence; design, implementation and application of intelligent systems/agents; exploring the design space of intelligent systems/agents; and ultimately, augmenting and extending human intellect and abilities. AI involves both algorithms and systems, with a focus on endowing computers with human-like intelligence to solve problems. This course is the first of a two-semester capstone for the Bachelor of Science in Artificial Intelligence Methods and Applications major. The goal of this course is for students to demonstrate their ability to (1) map a real-world problem that requires an AI solution (e.g., learning, inference, automated or semi-automated decision making, etc.) to an AI formulation of the problem, (2) design and prototype an initial AI solution to the problem using AI problem-solving methods, knowledge representation, machine learning, model-based inference, and automated decision making, based on concepts, techniques, and algorithms learned from at least two AI courses (e.g., A-I 370, A-I 375, and DS 310/CMPSC 448/CMPSC 445). Furthermore, this first AI capstone course introduces students to the basics of project management, including, but not limited to, creating and refining, if needed, the scope, the tasks, and milestones of the project, as well as roles and responsibilities of each team member. Capstone projects are typically group-based, consisting of 2-4 members. Capstone projects can be initiated from various sources: instructor-initiated projects, student-proposed projects, and industry partner-initiated projects. The applications for the projects can range from personalized recommender systems and object recognition in images to stock price prediction, traffic pattern recognition, computerized assistance for medical diagnosis, and pathfinding for robots, among others. The students of this first AI capstone course will also be using a project management tool to facilitate teamwork, to uncover risks early, and to investigate suitable adaptation strategies.

AIMA 440: AI Capstone II: Project Implementation

3 Credits

Artificial Intelligence (AI) is an interdisciplinary field concerned with the study of computational models of intelligence; design, implementation and application of intelligent systems/agents; exploring the design space of intelligent systems/agents; and ultimately, augmenting and extending human intellect and abilities. AI involves both algorithms and systems, with a focus on endowing computers with human-like intelligence to solve problems. This course is the second of a two-semester capstone for the Bachelor of Science in Artificial Intelligence Methods and Applications (AIMA) major. The goal of this course is for students to demonstrate their ability to first perform a comprehensive evaluation of the prototype AI solution developed in AIMA 430 (AI Capstone I - Project Design), which includes, but is not limited to usability, security, performance, cost, robustness, interpretability or explainability, and ethical implications of the AI solution. Based on results of the evaluation, students will be able to apply AI problem-solving methods, AI models (knowledge-based or machine learning-based), and AI-based automation learned from at least two AI courses to enhance the prototype AI solution toward the goal of a real-world deployment of the AI solution. The readiness of the AI solution for a real-world deployment will be assessed by each student team from multiple perspectives, including, but not limited to, performance, ethical challenges, reproducibility, observability, potential limitations, and potential benefits of the deployment. Students are also expected to apply project management skills they learned in AIMA 430 to this second AI Capstone project course for project planning, task assignments, progress tracking, risk identifications, and risk reduction approaches.