Translational AI Center (TrAC) Seminar - Fall 2021

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https://iastate.zoom.us/s/9378976918

Establishing correctness of learning-enabled autonomous systems

Autonomous systems are subject to multiple regulatory requirements due to their safety-critical nature. In general, it may not be feasible to guarantee the satisfaction of all requirements under all conditions. In such situations, the system needs to decide how to prioritize among them. Two main factors complicate this decision. First, the priorities among the conflicting requirements may not be fully established. Second, the decision needs to be made under uncertainties arising from both the learning-based components within the system and the unstructured, unpredictable, and non-cooperating nature of the environments. Therefore, establishing the correctness of autonomous systems requires a specification language that captures the unequal importance of the requirements, quantifies the violation of each requirement, and incorporates uncertainties faced by the systems. In this talk, I will discuss our early effort to partially address this problem and the remaining challenges.

Short Bio

Tichakorn (Nok) Wongpiromsarn received the B.S. degree in Mechanical Engineering from Cornell University in 2005 and the M.S. and Ph.D. degrees in Mechanical Engineering from California Institute of Technology in 2006 and 2010, respectively. She is currently an assistant professor in the Department of Computer Science at Iowa State University. Her research spans several areas of computer science, control, and optimization, including formal methods, motion planning, situational reasoning, hybrid systems, and distributed control systems. Most of her work draws inspiration from practical applications, especially in autonomy, robotics, and transportation. A significant portion of her career has been devoted to the development of autonomous vehicles, both in academia and industry settings. In particular, she was a principal research scientist and led the planning team at nuTonomy (now Motional), where her work focused on planning, decision making, control, behavior specification, and validation of autonomous vehicles.