

Title:

Towards Comprehensible Representation of Controllers using Machine Learning: Inductive Logic Programming

Keywords:

Cyber Physical Systems
Controller Synthesis
Model Checking
Machine Learning
Inductive Logic Programming
Domain Knowledge
Strategy Representation

Abstract:

Given the mathematical model of cyber physical systems along with their specifications, model checkers can be used to synthesize controllers for them. These controllers may be very long and difficult to understand, and thus machine learning can be employed to learn concise representations of these descriptions. This talk will be about using a new approach in machine learning to make controller analysis easier: inductive logic programming.

Not only does this approach aim to represent the controllers synthesized by model checkers in a succinct manner, but it also incorporates the domain knowledge of the system.

I will also briefly discuss about the implementation of a visualization tool for simulating custom strategies in PRISM. Ultimately, a lucid controller representation along with a tool to visualize it will help the software engineer debug and monitor the system much more efficiently.

About me:

This talk will be a summary of my summer internship at TUM under Prof Jan Kretinsky (as part of the DAAD program). I am currently going to enter my fourth year of Bachelors in Computer Science at Birla Institute of Technology and Science, Pilani, Goa, India. I am an enthusiastic coder and an avid musician.