IST AUSTRIA
Institute of Science and Technology

Institute colloquium

(CANCELED) Safety autonomy: a formal methods approach

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Host: Krishnendu Chatterjee

Autonomous systems interacting with the physical world, collecting data, processing it using machine learning algorithms, and making decisions, have the potential to transform a wide range of applications including medicine and transportation. Realizing this potential requires that the system designers can provide high assurance regarding safe and predictable behavior. This motivates research on formally verifying safety (such as avoidance of collisions) of closed-loop systems with controllers based on learning algorithms. In this talk, I will use the experimental platform of the autonomous F1/10 racing car to highlight research challenges for verifying safety for systems with neural-network-based controllers. Our solution to safety verification, incorporated in the tool Verisig at Penn, builds upon techniques for symbolic computation of the set of reachable states of hybrid (mixed discrete-continuous) systems. The case study consists of training the controller using reinforcement learning in a simulation environment, verifying the trained controller using Verisig, and validating the controller by deploying it on the F1/10 racing car.

Friday, March 13, 2020 04:00pm - 05:00pm

IST Austria Campus Raiffeisen Lecture Hall, Central Building

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