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Using data to tackle uncertainty in correct-by-design control synthesis

We often lack exact model knowledge of the dynamics of systems that we want to control in a verifiable manner. This can be due to lack of information on the physical composition of dynamic systems and its environment or due to wear and tear of the physical system during operation. Using data-driven approaches, controllers for these systems can be still formally verified. In this talk I will cover some of our results on data-driven verification and control synthesis for linear and nonlinear (stochastic) dynamics. I will talk about direct data-driven control synthesis and about Bayesian data-driven and model-based approaches.