In many application domains, Simulink/Stateflow serves as a platform for model-based development of the reactive embedded code, that interacts with its environment in real-time fashion. The talk will discuss a model-based approach for testing Simulink/Stateflow code, based on its automated translation to input-output extended finite automaton (I/O-EFA), followed by automated test-generation, guaranteeing user-defined code as well as requirements coverage, and also support for automated test-execution and error-localization. The offline testing of embedded code is further supplemented by its online monitoring for additional error detection and localization, and the talk will also present our approach for the same. System level measurements can be corrupted by noise, and a stochastic reasoning framework will be presented with conditions for achieving desired rates of false negatives and positives.

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