

## **Model-Based Event Sequence Testing of Graphical User Interfaces**

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Computer-based systems interact with users through graphical user interfaces (GUIs). Large systems usually have sophisticated GUIs, which are commonly fault-prone and need to be carefully designed, implemented, and tested. Testing GUIs is a complex and challenging task for many reasons: First, the input space possesses a significant, potentially infinite number of combinations of inputs and events that occur as system outputs; external events may interact with these inputs. Second, even simple GUIs possess an enormous number of states due to interaction with the inputs. Finally, many complicated dependencies may hold between different GUI states and their inputs.

Since thorough GUI testing is usually not feasible and ad-hoc testing is not systematic, model-based testing techniques can help. A model is a description of a system's behavior and can be used to generate test cases for some coverage criteria. Many graph-based models, such as finite-state machines and event sequence graphs, are used for automatic test generation. In this tutorial, the focus will be on events rather than states since states' controllability and observability may be more complicated than events in GUIs. The tutorial will review and exemplify event-based testing techniques for model-based GUI testing.