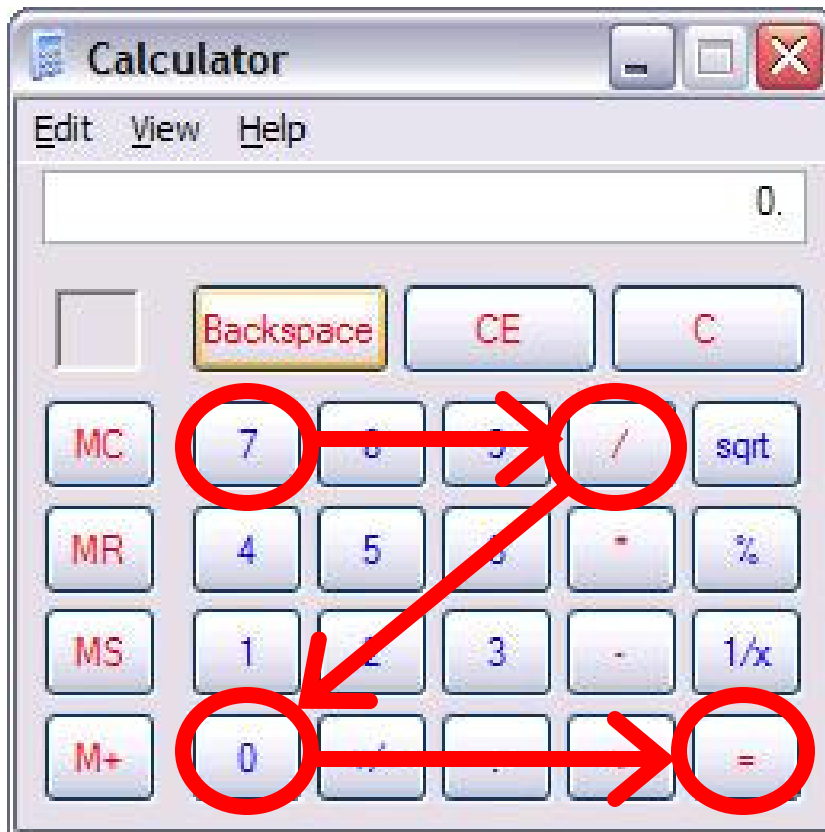


# On the Affinity Between Test Suites and Faults in GUI-Based Applications

Jaymie Strecker  
([strecker@cs.umd.edu](mailto:strecker@cs.umd.edu))  
Maryland Software Day  
November 3, 2006

# Testing GUI-Based Applications



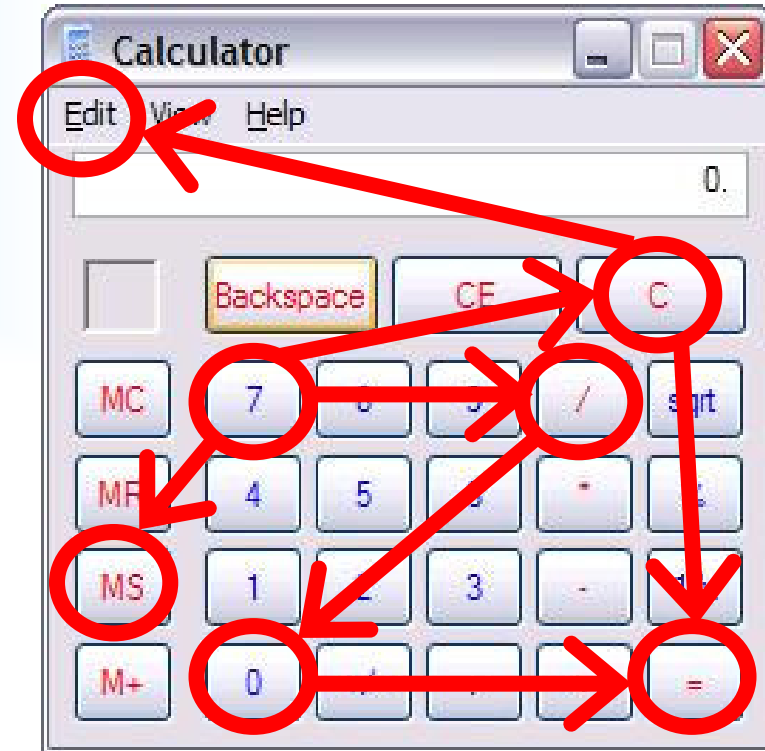
GUI test case  
=  
event sequence

# Evaluating GUI Testing Techniques

- If you have a GUI-based application, what is the best way to test it?
  - Empirical studies of testing techniques can help...
  - ... if the applications in the studies look like your application.

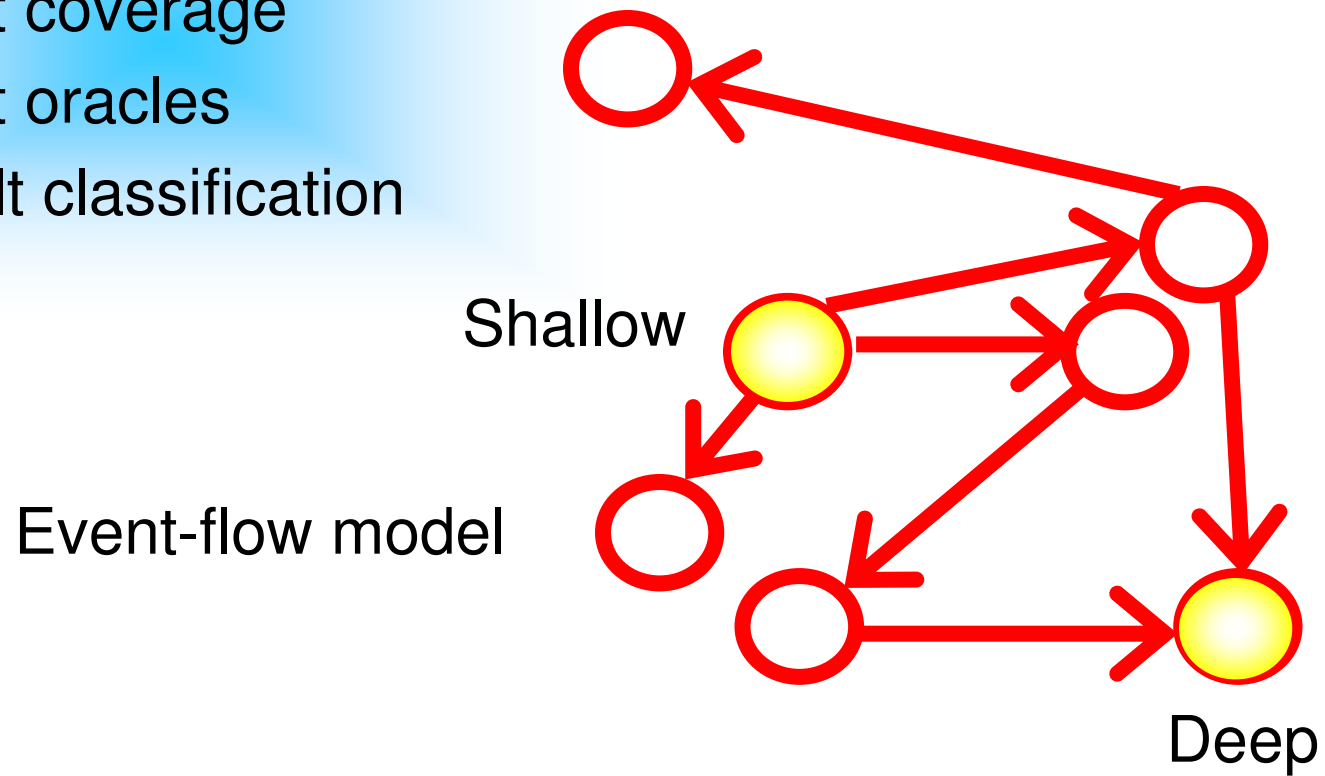
# Empirical Studies of GUI Testing

- Problems in GUI testing
  - Test case generation
  - Test coverage
  - Test oracles
  - Fault classification



# Empirical Studies of GUI Testing

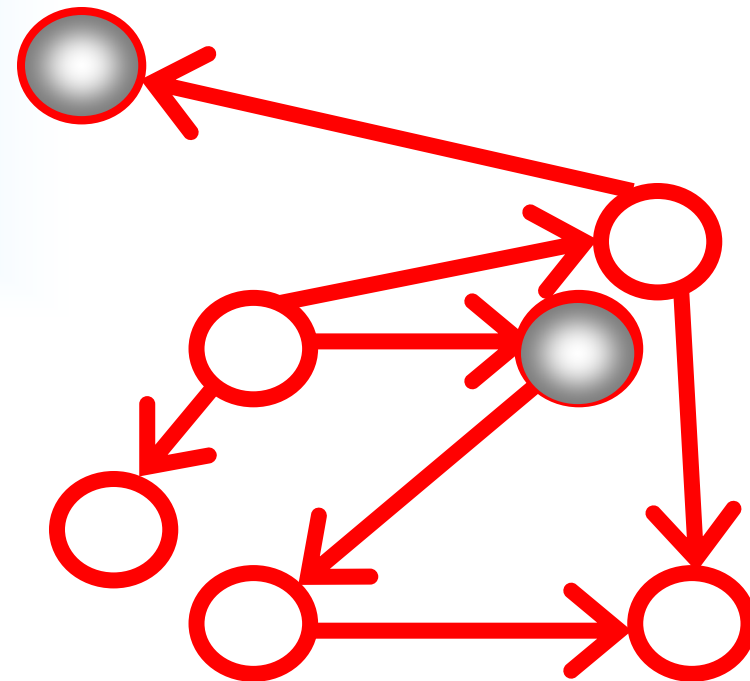
- Problems in GUI testing
  - Test case generation
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# Empirical Studies of GUI Testing

- Problems in GUI testing
  - Test case generation
  - Test coverage
  - Test oracles
  - Fault classification

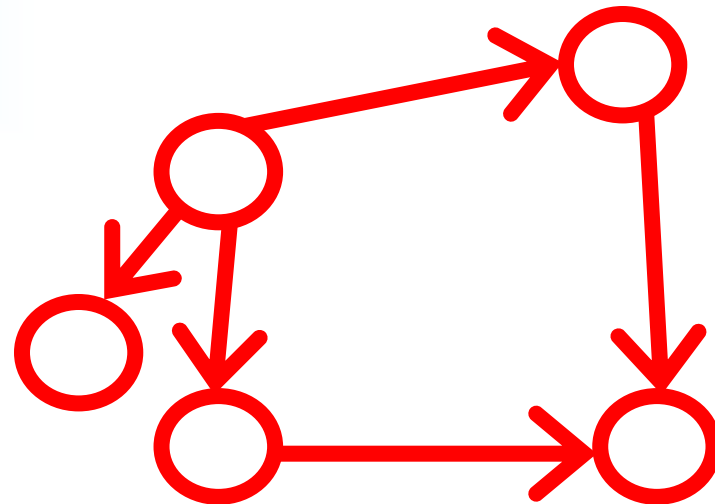
Event-flow model



# Empirical Studies of GUI Testing

- Problems in GUI testing
  - Test case generation
  - Test coverage
  - Test oracles
  - Fault classification

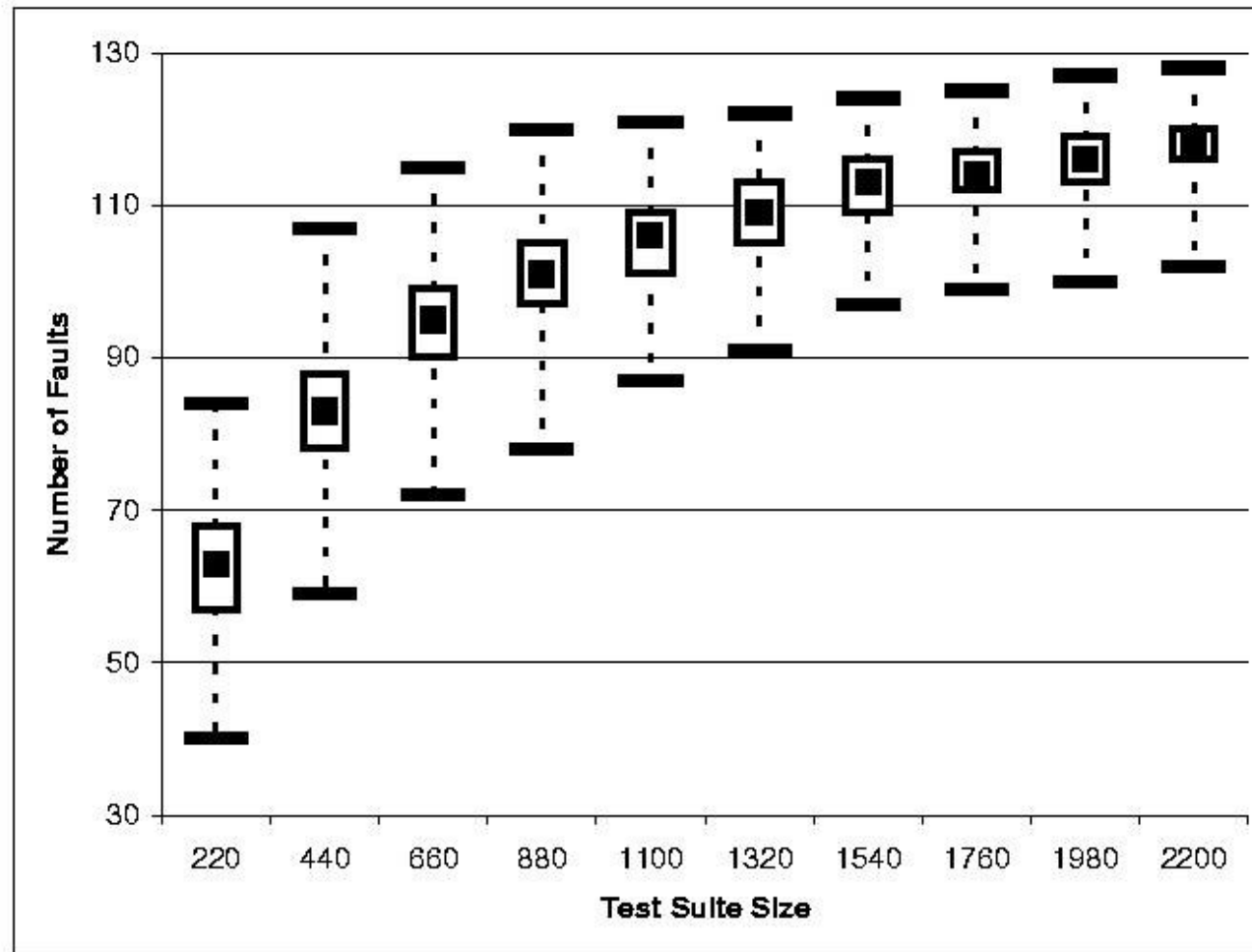
Event-interaction model



# Empirical Studies of GUI Testing

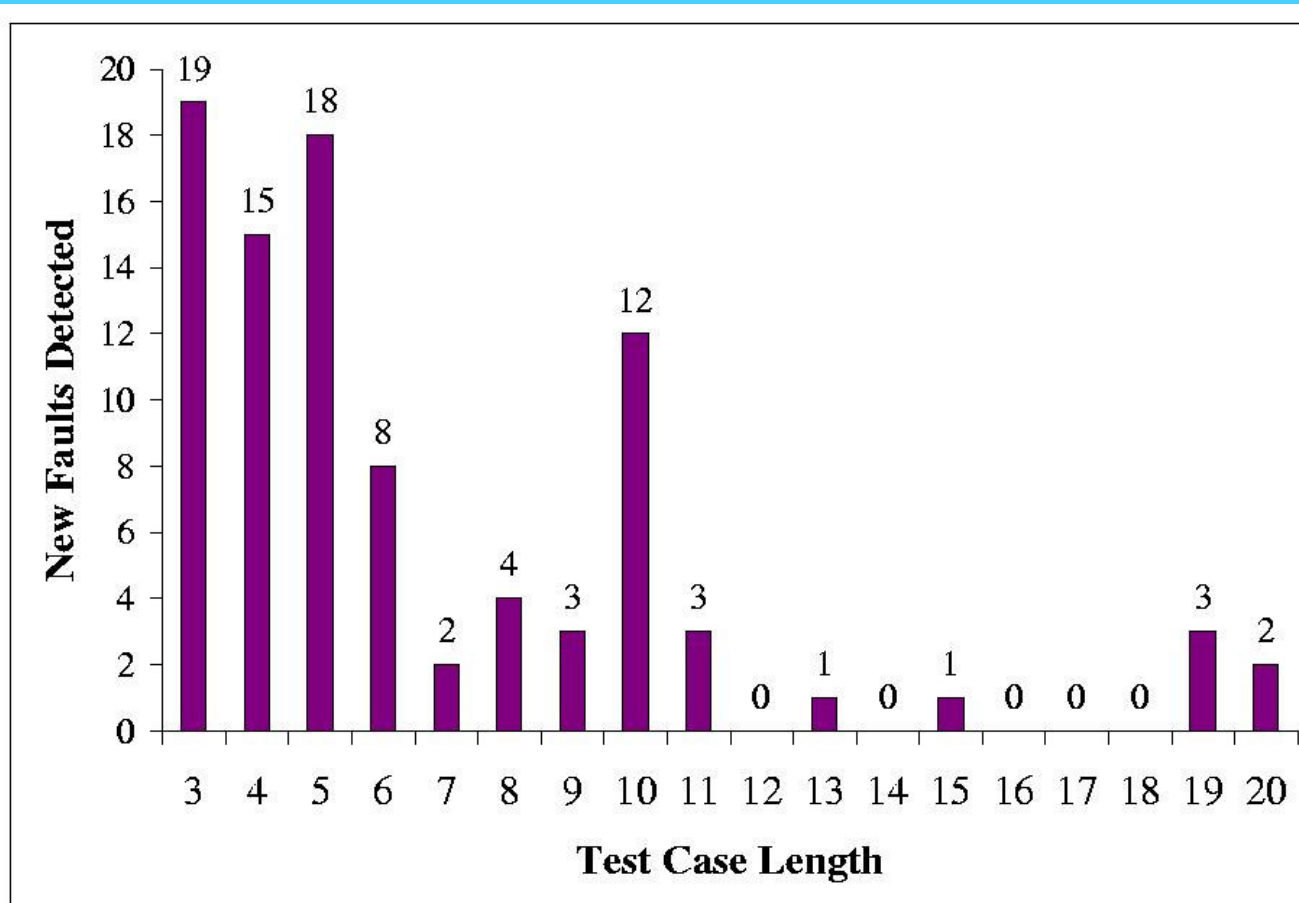
- Challenges of empirical studies
  - Must generate and run *many* test cases, which requires infrastructure and automation
    - GUITAR tools – ripper, test case generator, replayer
  - Enormous computation time
    - Condor universe
  - Availability of sample applications

# Evaluating GUI Testing Techniques: Study in Progress



ISSRE'06

# Evaluating GUI Testing Techniques: Study in Progress

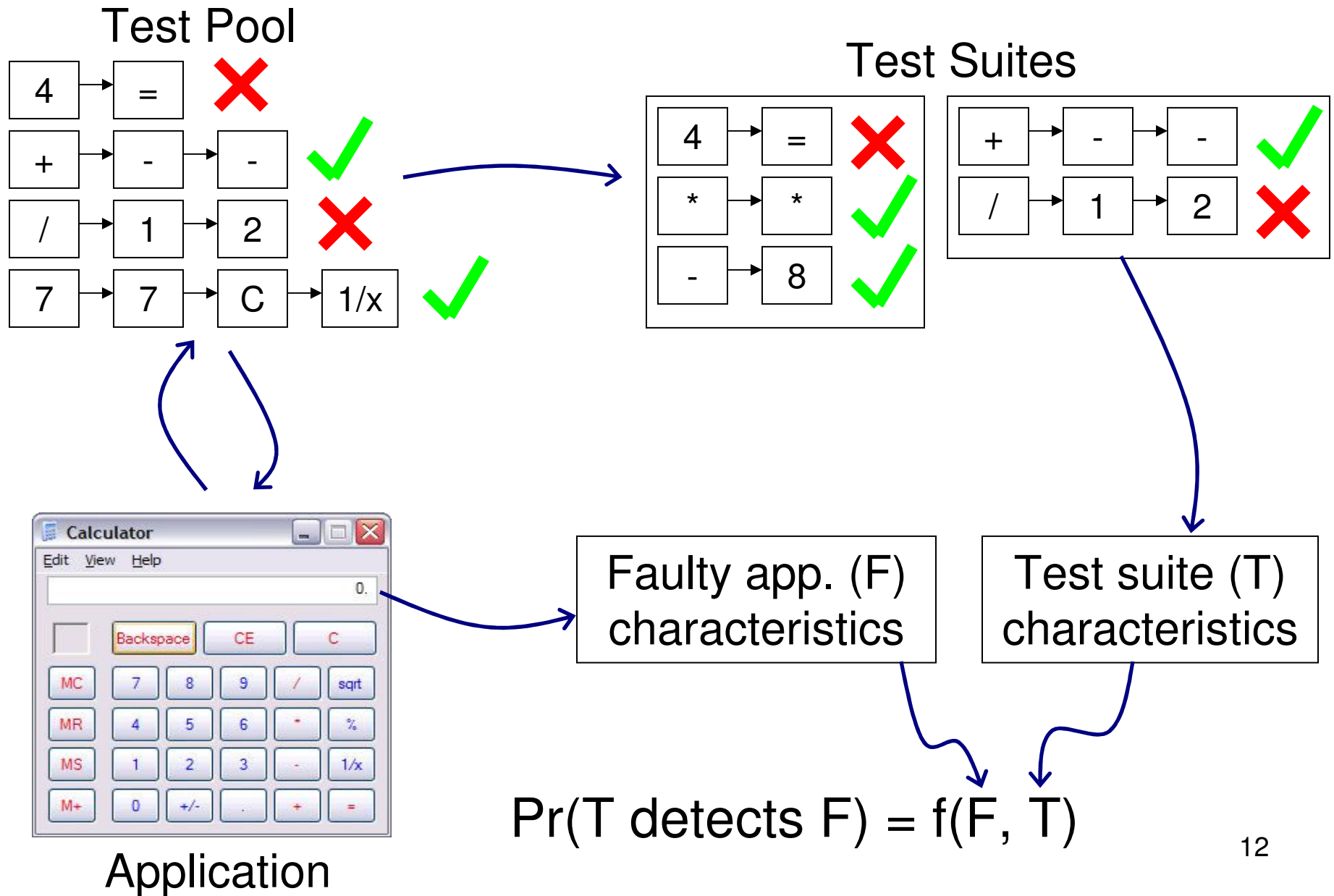


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# Evaluating GUI Testing Techniques: Study in Progress

<b>Test suite</b>	<b>Faulty Application</b>
Number of test cases Size of test inputs	Type of application Size of application Type of faults Size of faults Deep vs. shallow faults

# Empirical Study Design



# Summary

- Testing GUI-based applications is a black art. Which technique is best?
  - Empirical studies can help...
  - ... if the study context is similar to the real application context.
- Our empirical results
  - Graph model of GUIs
  - Deep vs. shallow faults
- Extensions to other types of applications