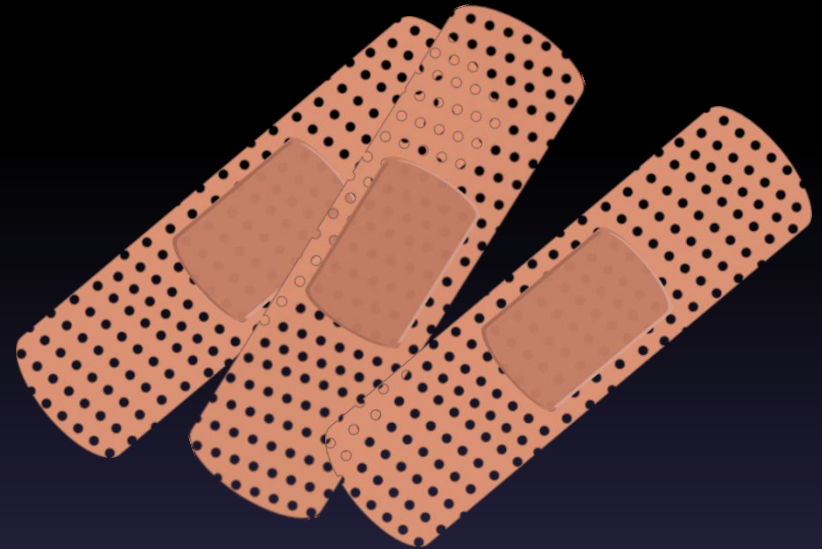


# Genetic Improvement using Higher Order Mutation

Yue Jia, Fan Wu, Mark Harman and Jens Krinke

# Genetic Modifications



Evolve an entire program

Finely control  
the code generation

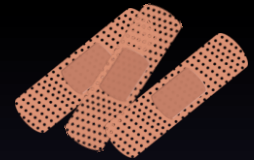
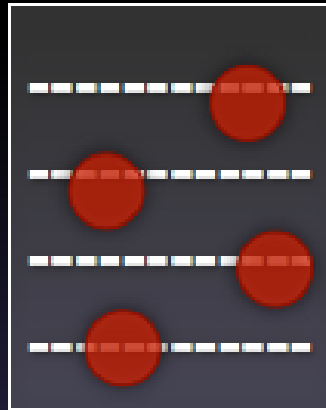
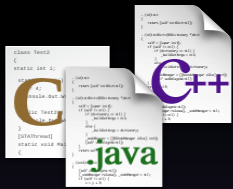
Small to medium sized system

Evolve a sequence of edits

Coarse level  
of genetic modifications

Large real world systems

# Genetic Modifications

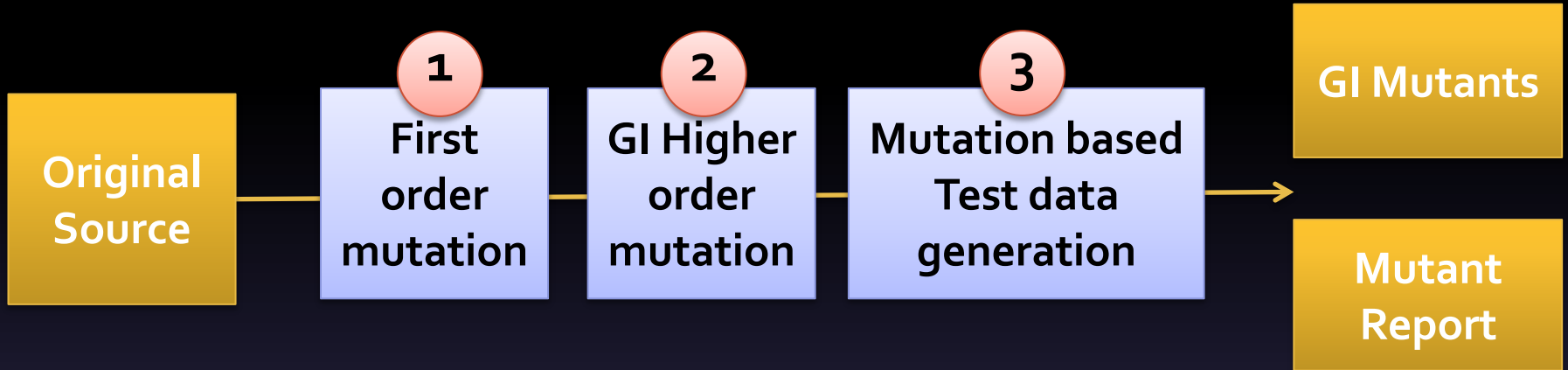


## Higher Order Mutants

Modifications based on a set of mutation operators

HOMT is flexible and provides a finer level of control in the code generation

# Higher Order Mutation GI



- 1 Sensitivity Analysis\*
- 2 Multi-objective Search
- 3 Faithfulness Analysis

\* Wednesday, SBSE-SS3

# Discussions

Do mutation operators provide a generic and scalable way to modify programs?

Is mutation-based test data generation sufficient for faithfulness analysis?