Genetic Improvement using Higher Order Mutation

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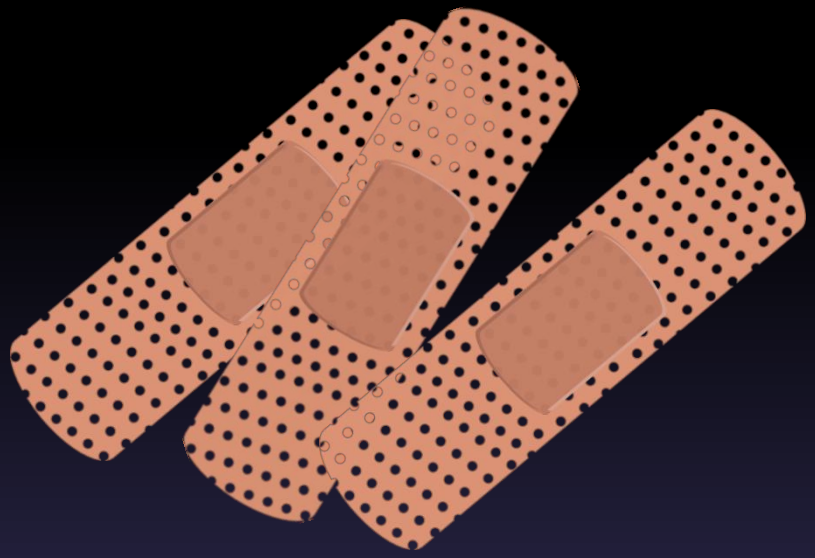
Genetic Modifications



Evolve an entire program

Finely control
the code generation

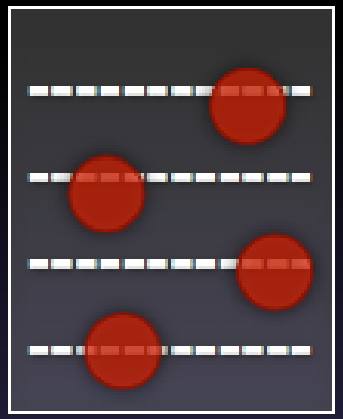
Small to medium sized system

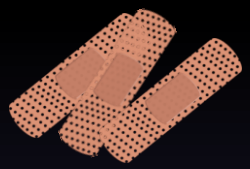
Evolve a sequence of edits

Coarse level
of genetic modifications

Large real world systems

Genetic Modifications



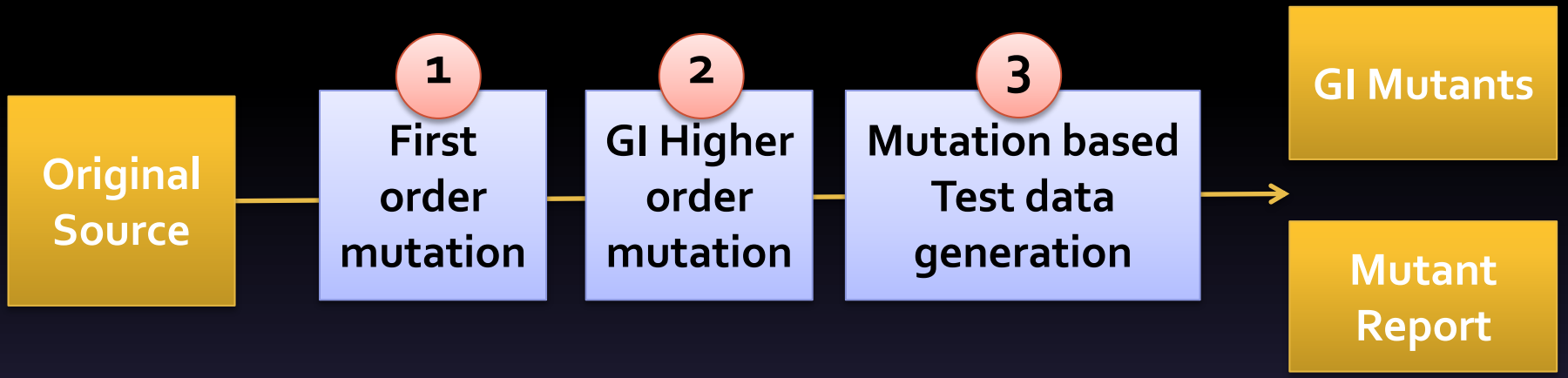


Higher Order Mutants

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?