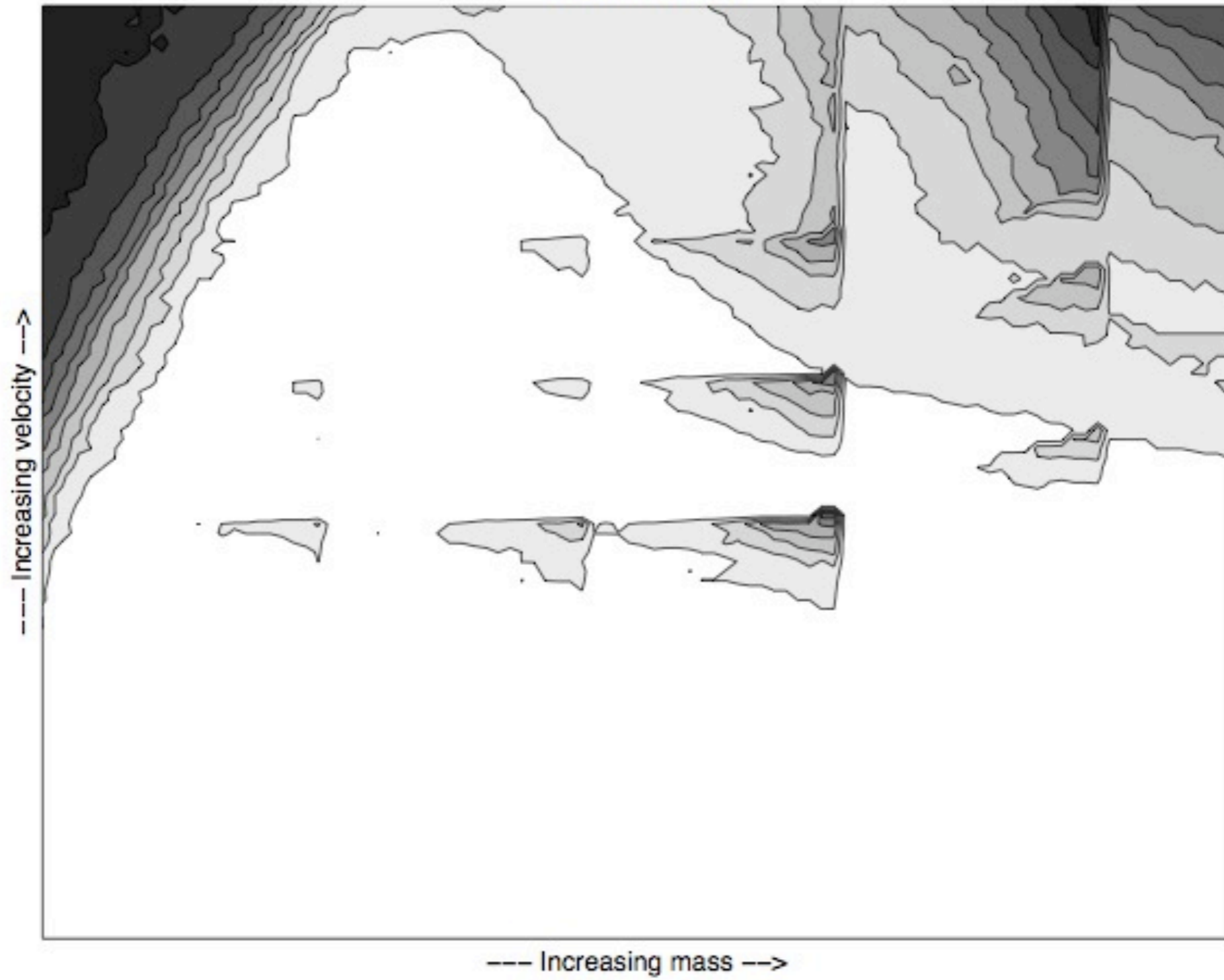


Interactive & Adaptive Automated Testing Environments

2013-04-23 @ COW-26, London

Robert Feldt

Test case difficulty



Test case difficulty

Increasing velocity →

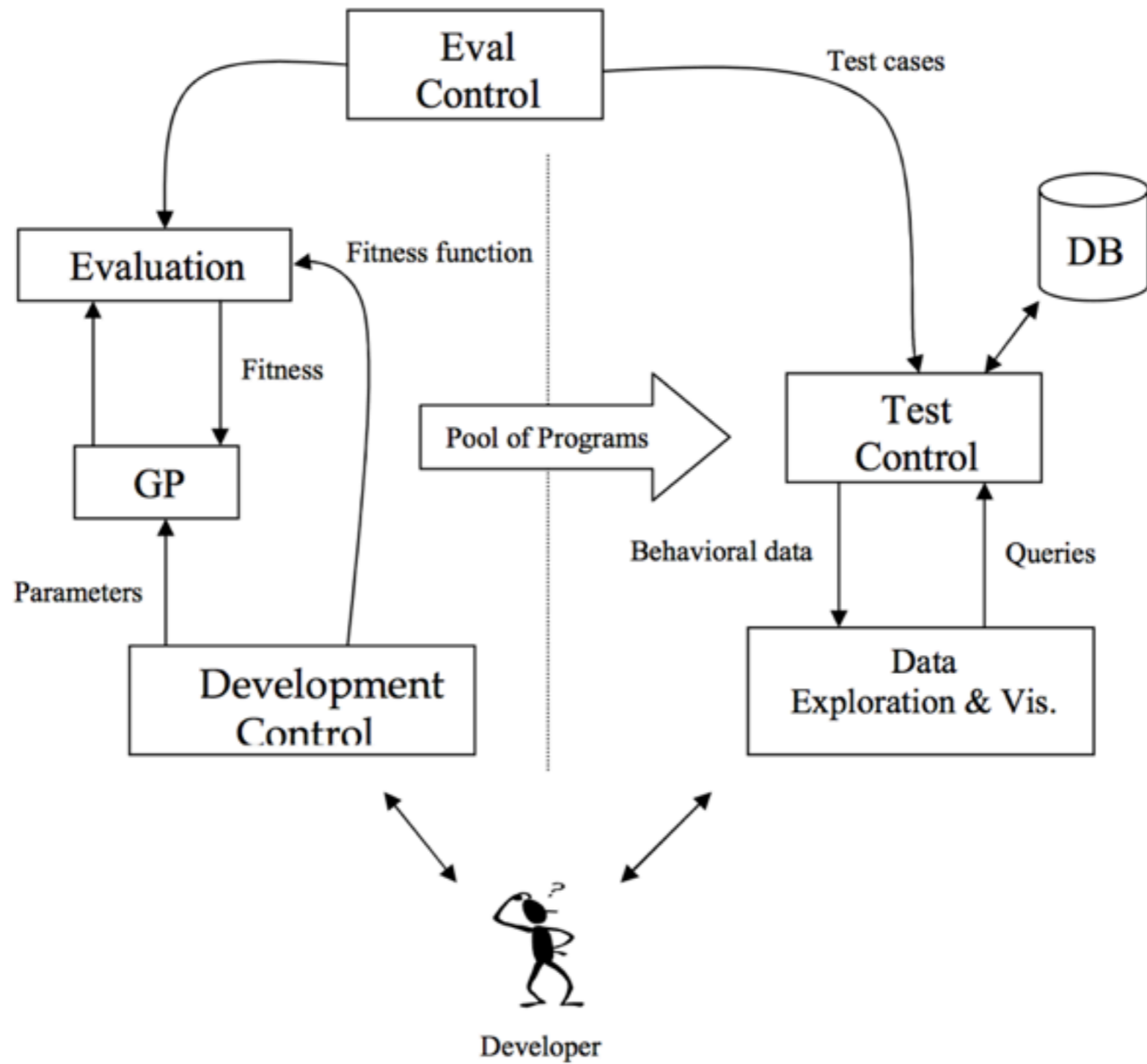


Figure 2. Conceptual diagram of a SPE-GP environment

Test case difficulty

Eval
Control

Test cases

WiseR - Workbench for Interactive Software Engineering in Ruby

File Edit Modules Help

Specification **Code** Knowledge Base Tests Pools

```
class Array
  def maximum
    max = self[0]
    self[1..-1].each do |element|
      max = element if element > max
    end
    max
  end
end
```

WiseR - Workbench for Interactive Software Engineering in Ruby

File Edit Modules Help

Specification | Code | Knowledge Base | Tests | Pools

- Array#maximum raises NameError: undefined method `each' for nil
 - Array of size 0 filled with Symbol
 - Array of size 0 filled with String
 - Array of size 0 filled with Fixnum
- + Array#maximum returns Symbol
- + Array#maximum returns String
- + Array#maximum returns Fixnum

```
def test_15
  # Calling Array#maximum on
  # Array of size 0 filled with Fixnum
  [].maximum #=> raises NameError: undefined method `each' for nil
end
```

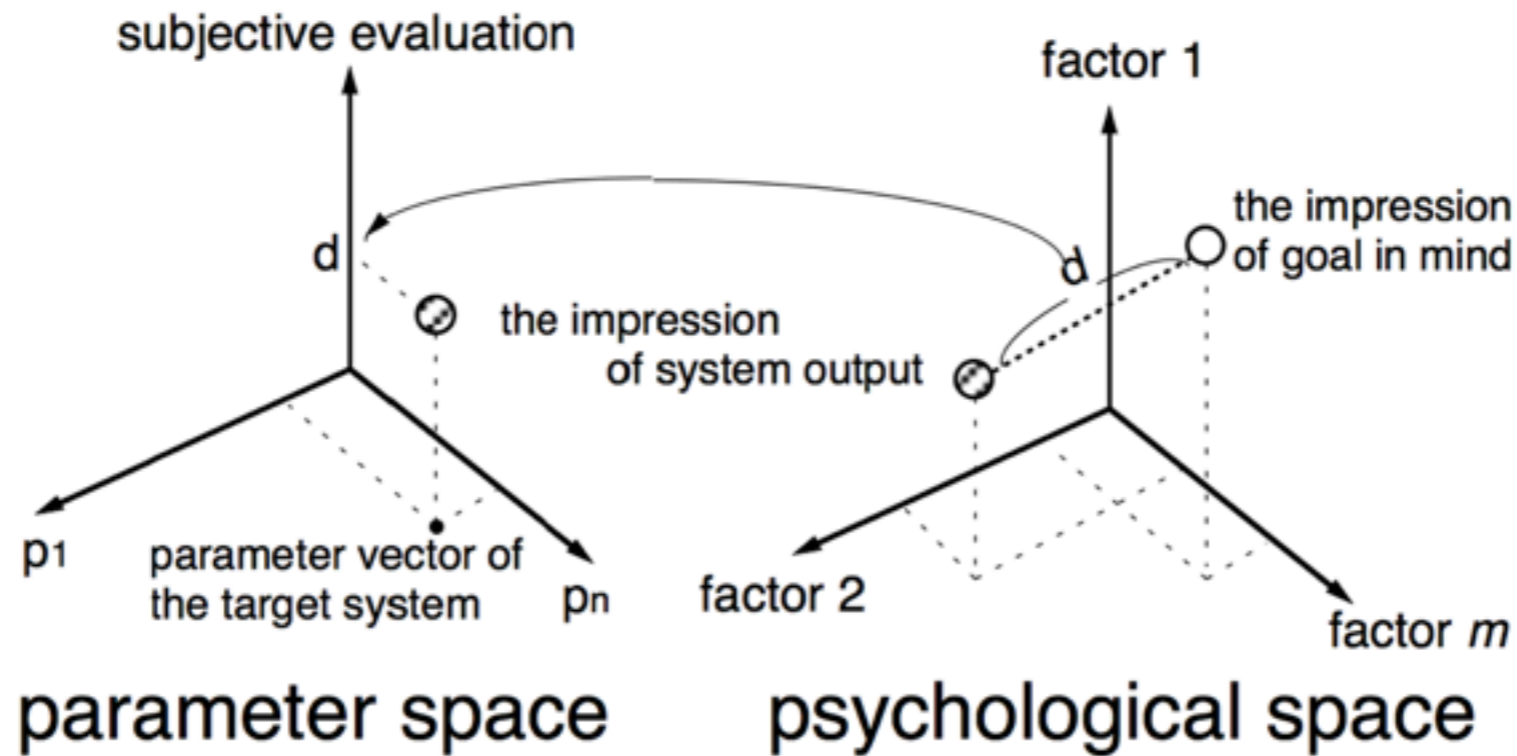


Fig. 2. Psychological distance between target in our psychological spaces and actual system outputs become the fitness axis of a feature parameter space where EC searches for the global optimum in an IEC system.

[Takagi2001] “Interactive Evolutionary Computation: Fusion of the Capabilities of EC Optimization and Human Evaluation”, IEEE TEC, 2001



System Render

Controls

Basic Advanced Color

Guidance

Focus:

Small Changes Big Changes

Population

1. Fitness guidance

1. Fitness guidance

“f-Equalizer”

1. Fitness guidance

“f-Equalizer”



1. Fitness guidance

“f-Equalizer”



1. Fitness guidance

“f-Equalizer”

Weight



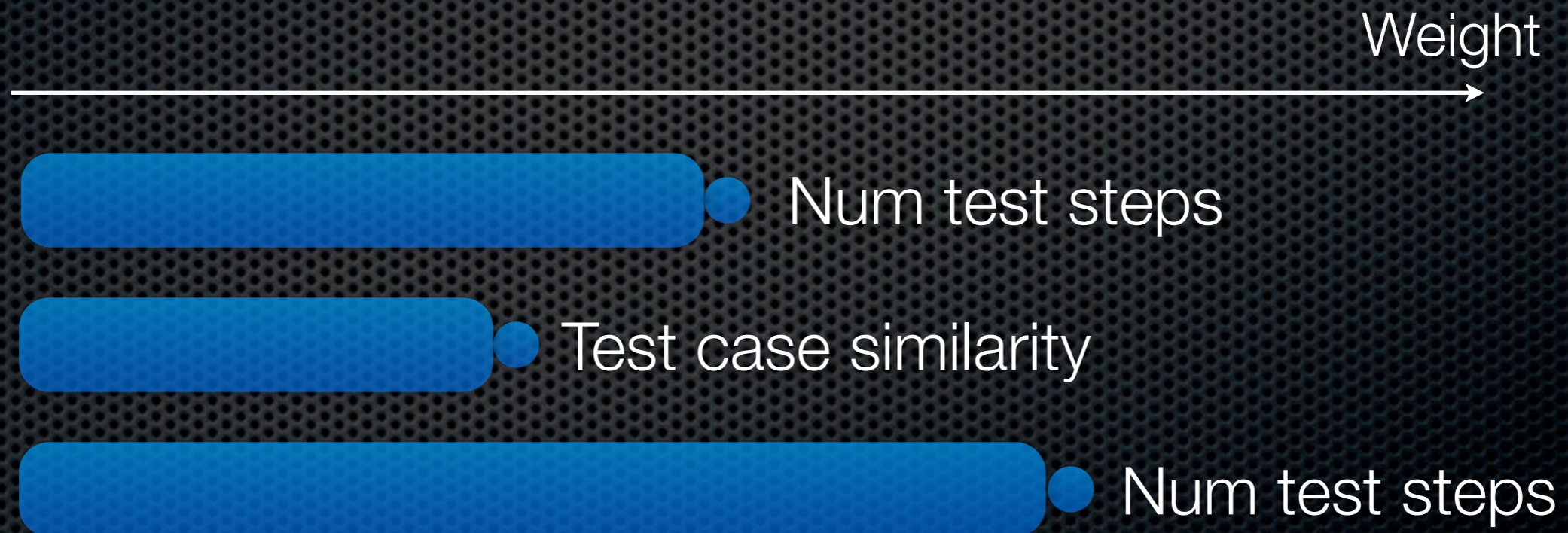
● Num test steps



● Test case similarity

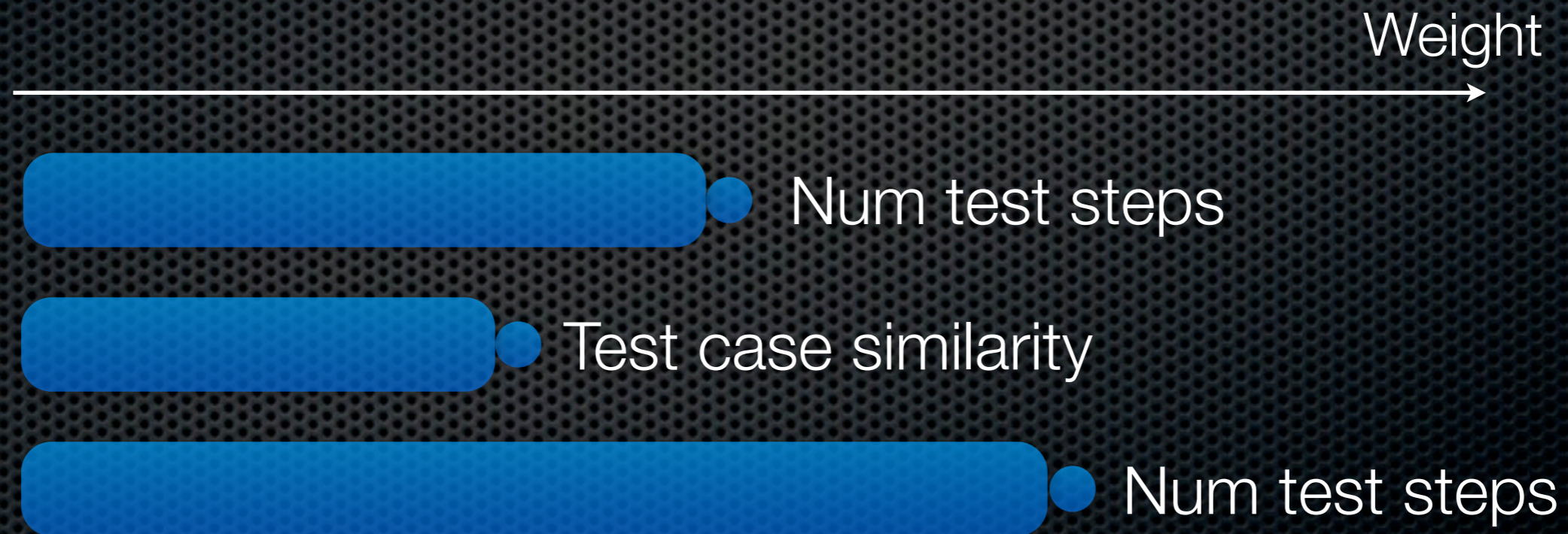
1. Fitness guidance

“f-Equalizer”



1. Fitness guidance

“f-Equalizer”



...

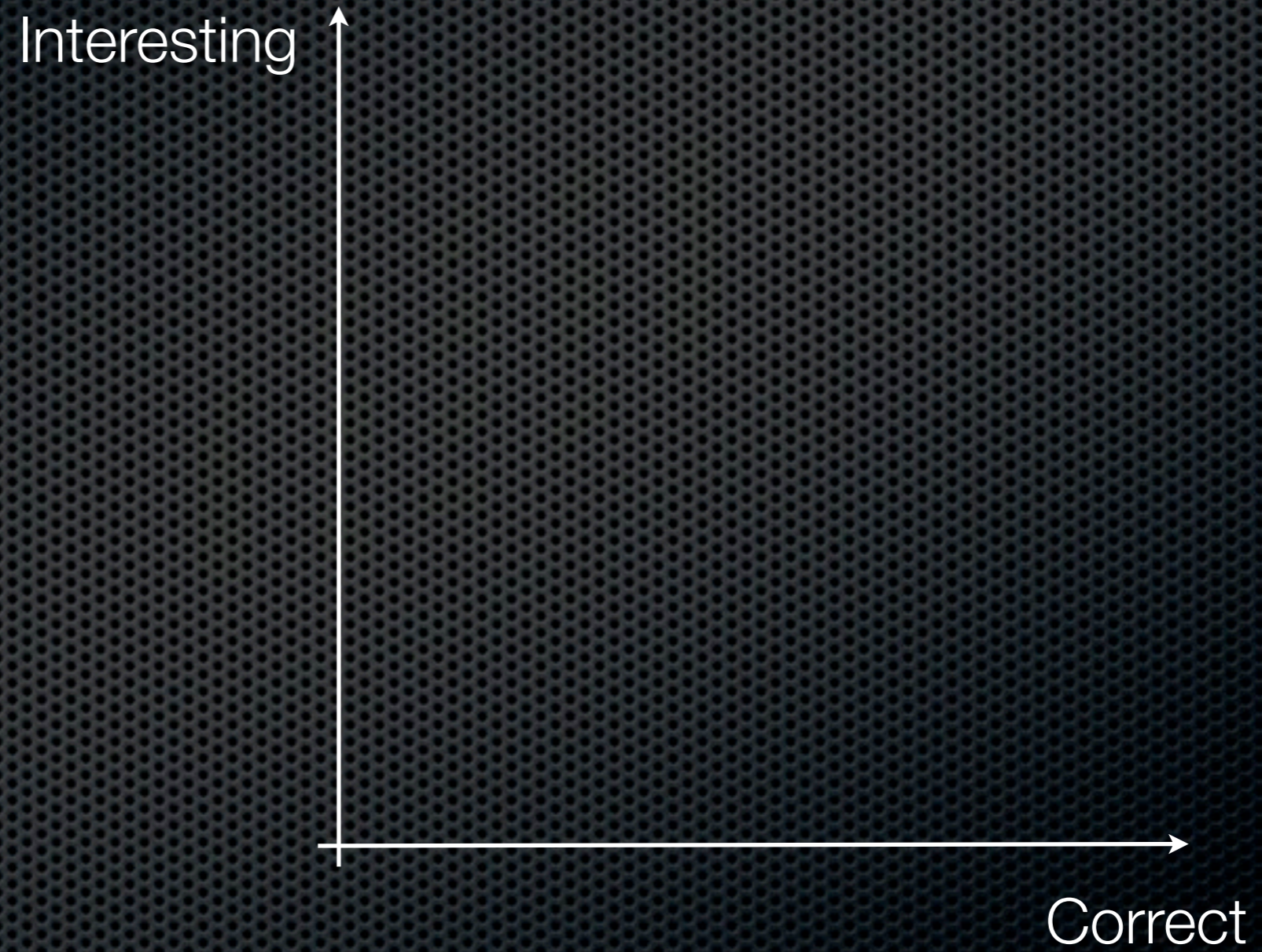
2. Selecting Tests

2. Selecting Tests



Correct

2. Selecting Tests



2. Selecting Tests

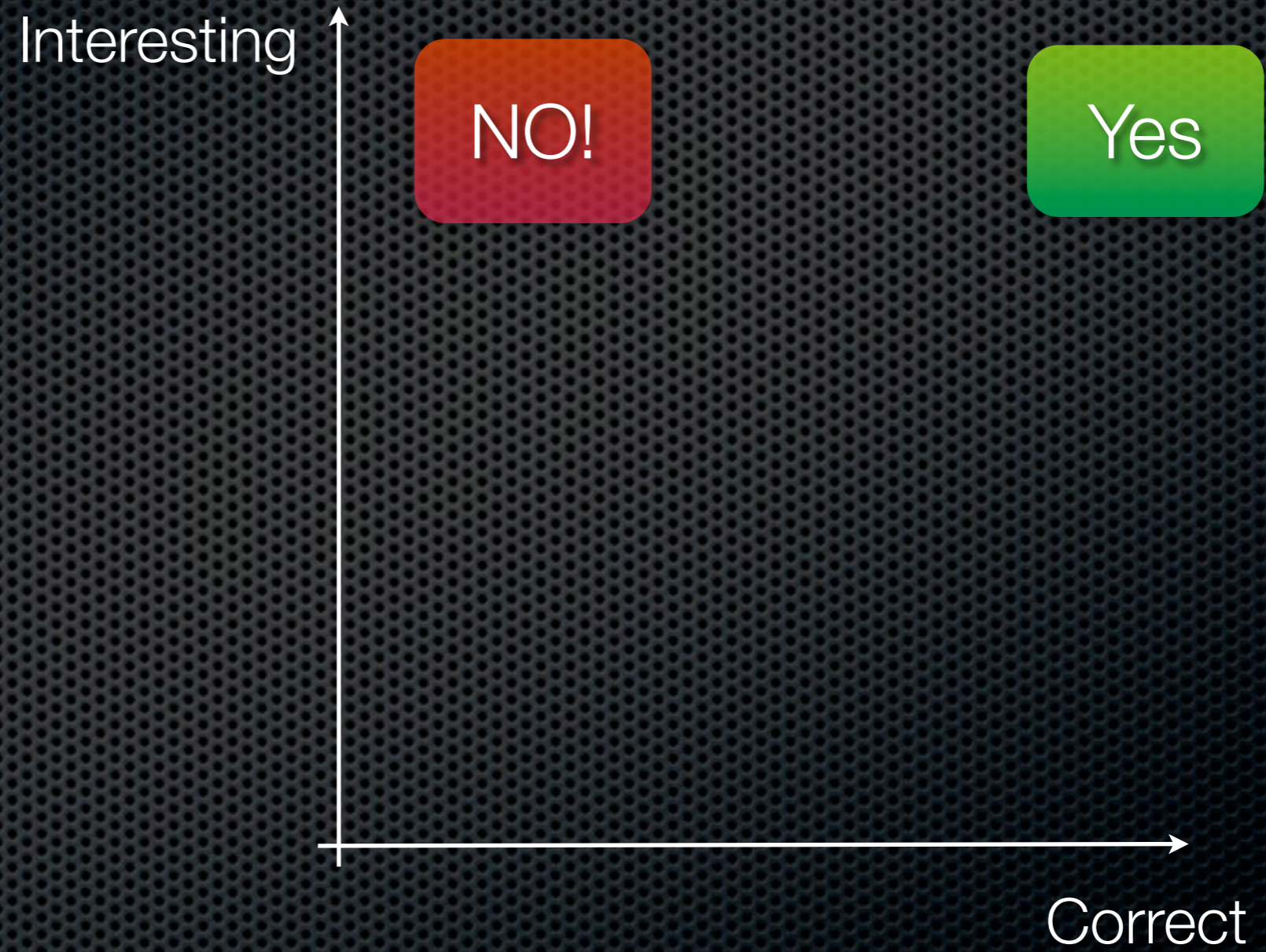
Interesting



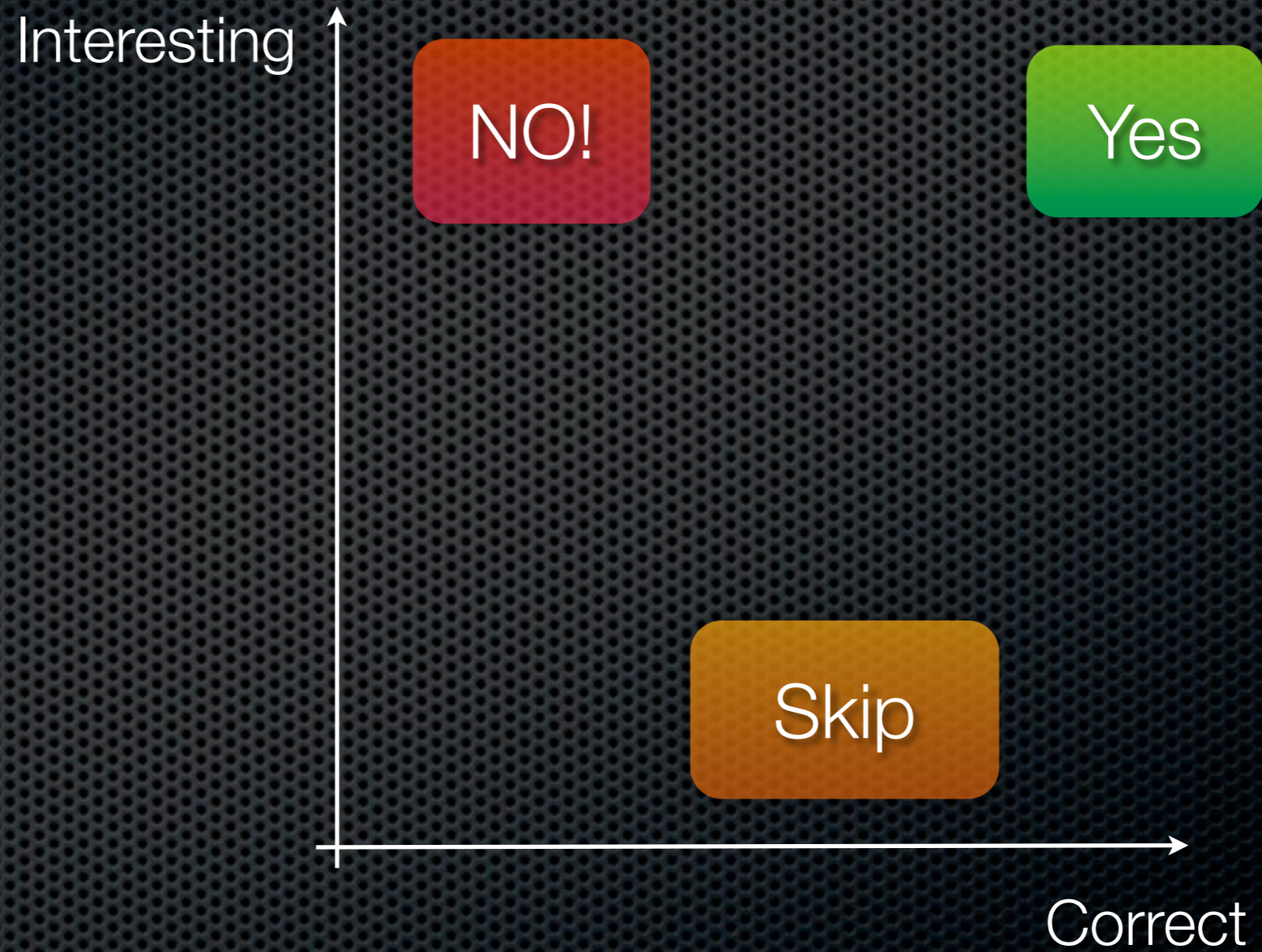
Yes

Correct

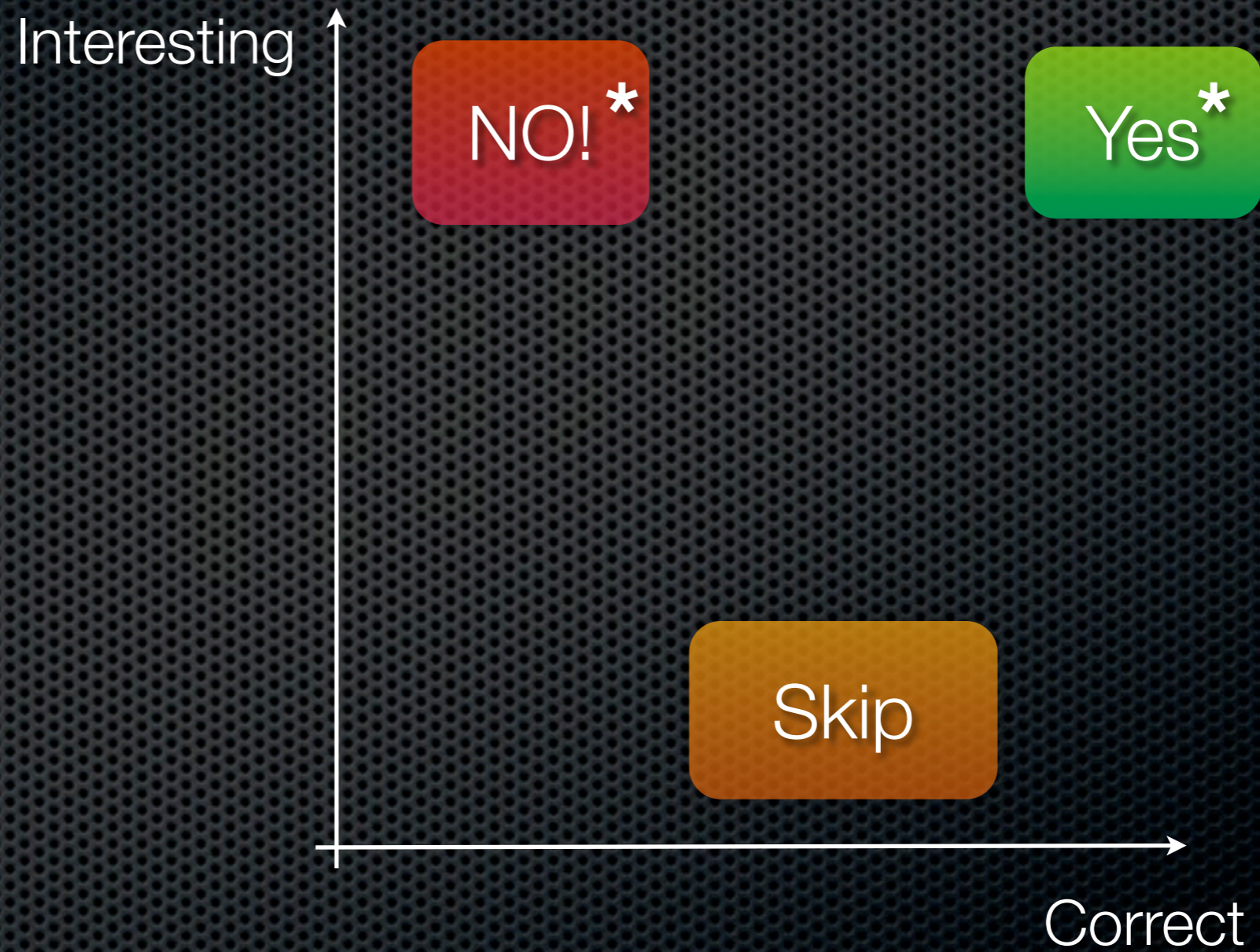
2. Selecting Tests



2. Selecting Tests



2. Selecting Tests



* Edits

Demo

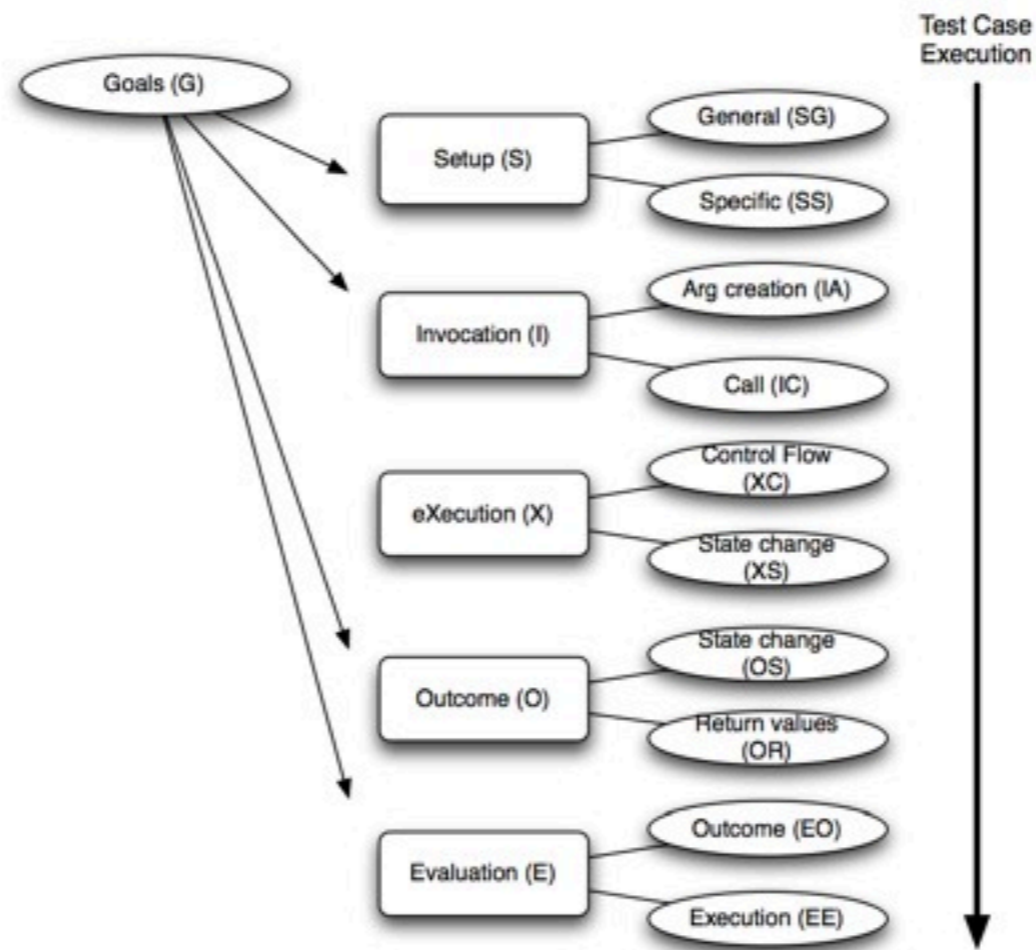


Figure 1. Execution of a software test.

[Feldt2008] R. Feldt, R. Torkar, T. Gorschek, and W. Afzal, "Searching for Cognitively Diverse Tests: Towards Universal Test Diversity Metrics", SBST, 2008.

