What Mike is doing in Hawai'i

ICSE 2011
Hawaii

33rd International Conference on Software Engineering

Waikiki, Honolulu, Hawaii
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- Four papers:
  - Inference of field initialization
  - Building and using pluggable type-checkers
  - Always-available static and dynamic feedback
  - Speculative program analysis

- Plus more UW papers:
  - Identifying program, test, and documentation changes that affect behavior

Inference of field initialization

```
public class MyWindow extends JWindow {
  private final String name;
  public MyWindow(String name) {
    super();
    this.name = name;
    …
  }
  …
}
```

Never null, yet NullPeinterException when accessing this.name

Accuracy >98% (by far the world's best)

Pluggable type-checking

Problem: Even if the type-checker succeeds, your program can still crash

Example: null pointer exception

Idea: create optional, stronger type systems

Tool: the Checker Framework

Results:

- Finds lots of real bugs
- Little annotation overhead
- Easy to get started using
- Easy to build new type systems

Complementary verification technologies

Static type-checking is useful

not always the most important goal

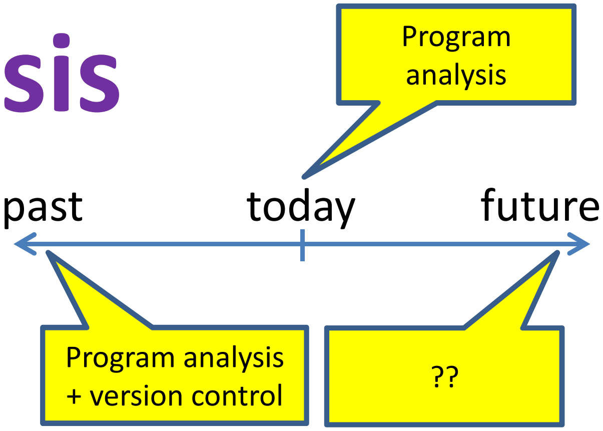
Dynamic testing is useful

not always the most important goal

Idea: let the programmer choose the best approach, at any moment during development

- Fast, flexible development, as with dynamic types
- Reliable, maintainable applications, as with static types

Program analysis



Informs you about your program

- Type-checking
- Testing
- Profiling
- Bug-finding
- Verification
- Collaboration

Idea: run program analysis on programs you have not yet written