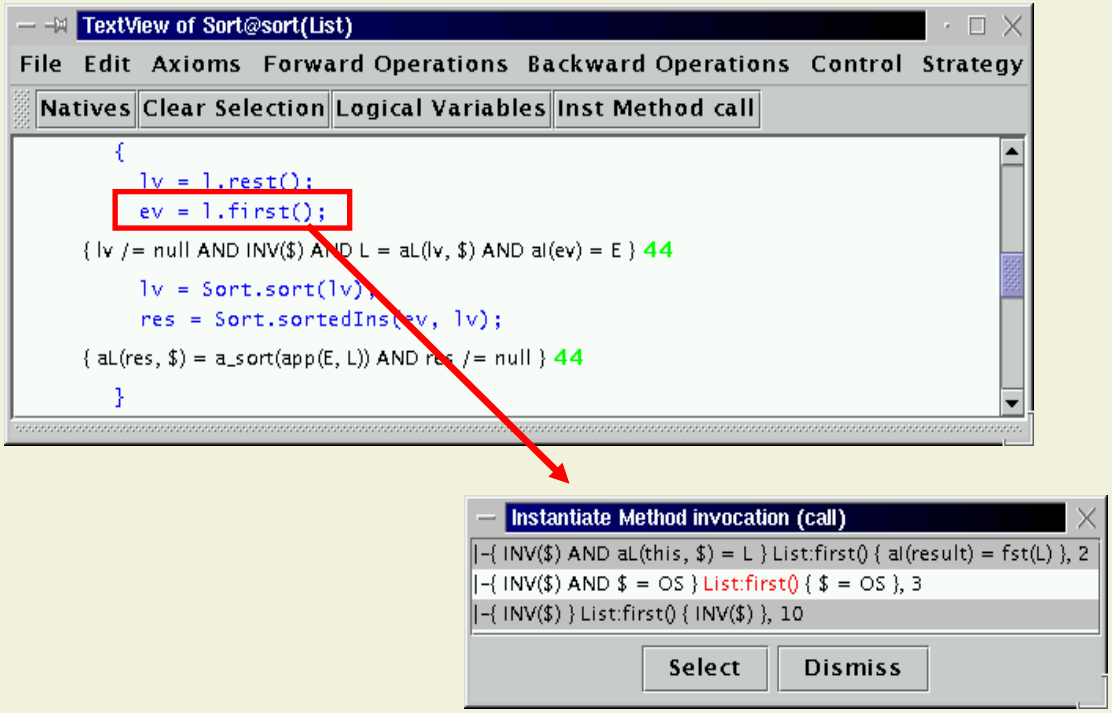
Our Research Activities

- Jive
  - Interactive program verification
- Boogie
  - Automatic program verification
- Proof-Carrying Components
  - Deployment of provably correct components
- Ownership Type Systems
  - Alias control

The JIVE System

- Interactive verification of Java programs
- Based on Hoare-logic for Java
- Proof steps are automated by strategies



JIVE – Possible Topic Areas

- Semantics of Interface Specifications
  - Clarify exact meaning of JML specifications
  - Define translation of specifications to the underlying logic
  - Non-null type system
  - Purity checking in JML
- Methodology
  - Proof strategies for higher degree of automation
- Development of a new front-end
  - To support the Java Modeling Language (JML)

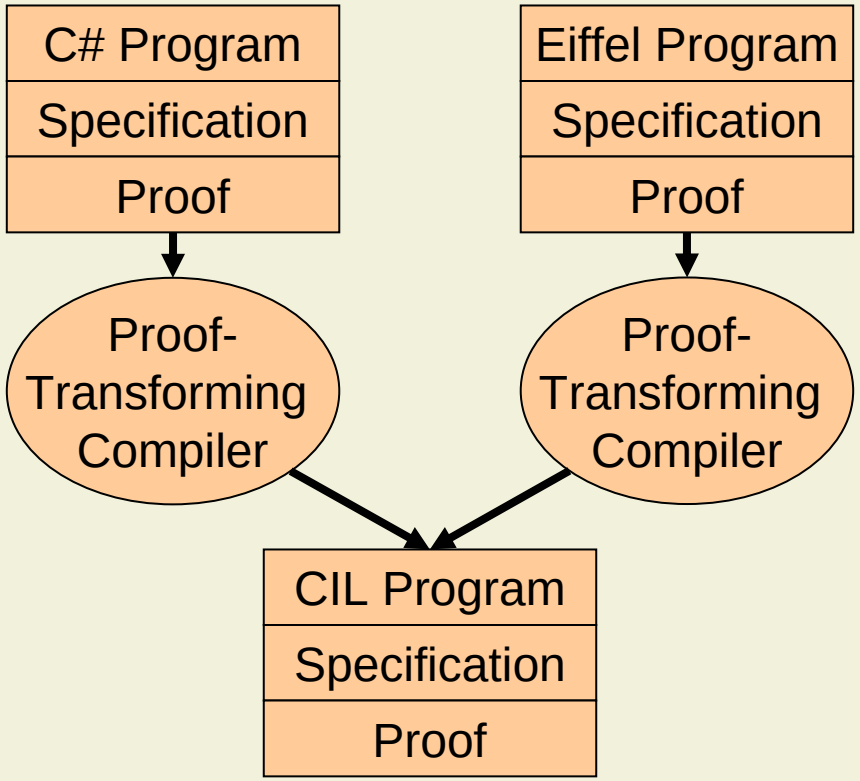
Boogie

- Extended static checking of Spec# programs
- Fully automated
- Cooperation with Microsoft Research

- Possible Topic Areas
  - Verification of design pattern implementations
  - Runtime checking of interface specifications

Proof-Carrying Components

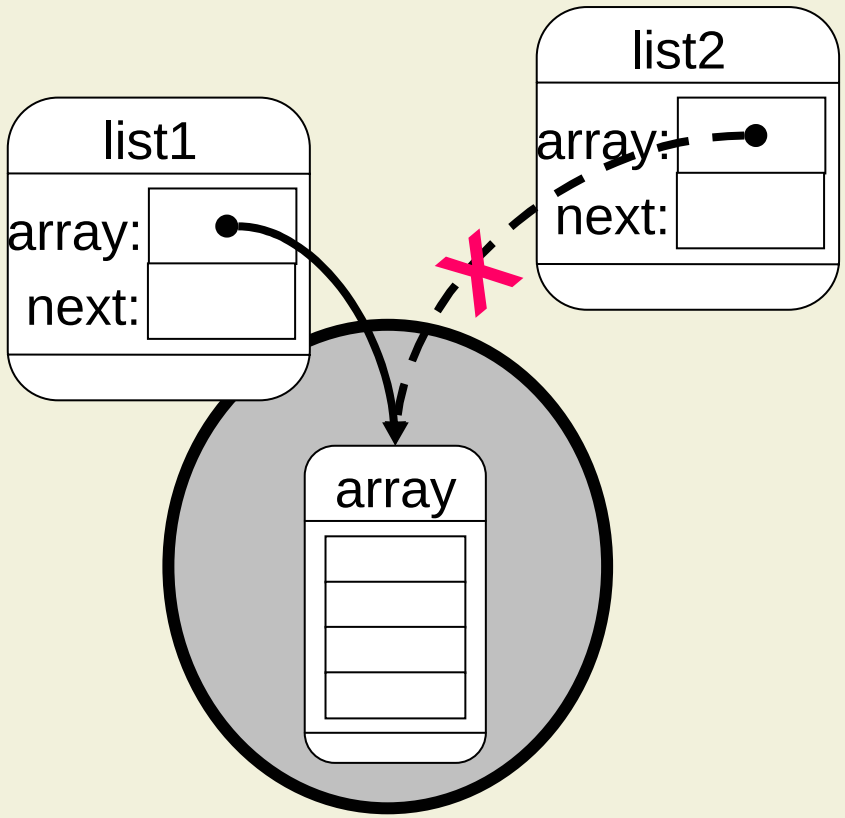
- CIL components can be reused together with embedded specifications and proofs



- Possible Topic Areas
  - PCC infrastructure (CIL semantics, proof checker)
  - Proof-transforming compilers

Alias Control with Universes

- The Universe type system checks encapsulation of object structures statically



- Possible Topic Areas
  - Bytecode support
  - Case studies
  - Type inference

We Want You!

For SCT Group