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- Program optimization
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- Program optimization
- Program correctness
Types of Program Analysis

- Static program analysis
Types of Program Analysis

• Static program analysis
• Dynamic program analysis
Techniques Static Analysis

- Control-flow

Control Flow Analysis
• Control-flow
• Data-flow analysis
Techniques Static Analysis

- Control-flow
- Data-flow analysis
- Abstract interpretation
Techniques Static Analysis

- Control-flow
- Data-flow analysis
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- Type systems
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- Effect systems
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- Effect systems
- Model checking

Figure 1.2: Schematic view of an a posteriori system verification.
Dynamic Program Analysis

• Testing

- Unit Test
- Integration Testing
- System Testing
- Acceptance Testing

ILLUSTRATION BY SEGUE TECHNOLOGIES
• P. Cousot. Abstract Interpretation in a Nutshell. [Online]. Disponible: http://www.di.ens.fr/~cousot/Al/IntroAbsInt.html#Cousot81-1
THANKS!