

# Sound and Soundness

## Practical Total Functional Data-Flow Programming

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- Compiler construction
  - declarative domain-specific
  - multi-paradigm, embedded
  - meta-programming
- Application fields
  - scientific modeling & simulation
  - real-time, embedded & control
  - music
- The SIG language and system

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# Yet Another Language? (1)

SIG is...

**LIKE** Visual data-flow tools

- for domain expert use
- complex component networks

**BUT** Semantically safe & sound

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- rigorous simple semantics (automata)
- specific model of time

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- clocked time  $\Rightarrow$  streams
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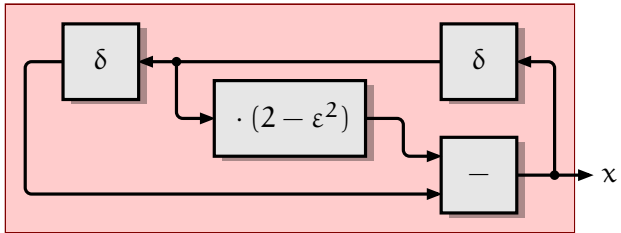
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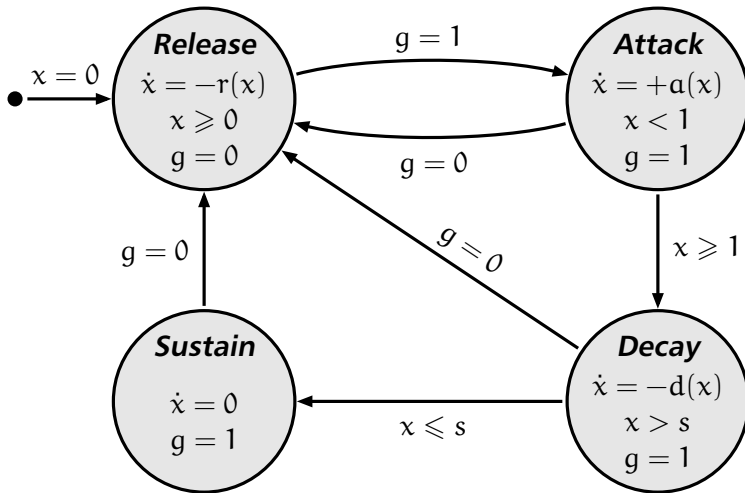
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- (Long design phase)
- Semantics & core calculus [MSFP'14]
- Prototype execution environment
  - hosted in Java
  - interpreter
  - jit-compiler to JVM bytecode







- configuration meta-programming
- multi-rate systems & slicing
- domain-specific type systems
- analysis tools
- backends for GPU, DSP, FPGA, ...