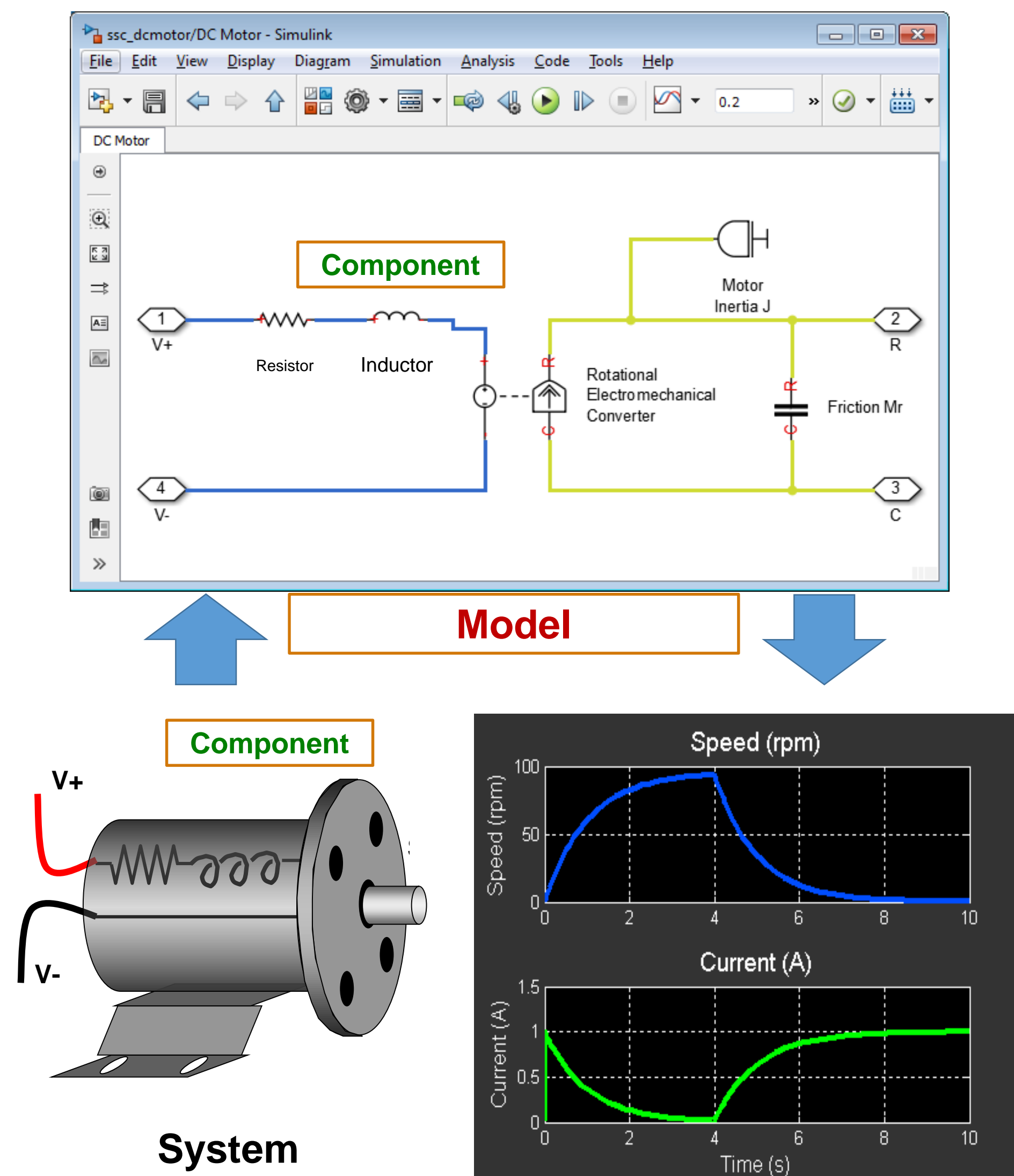


LLVM for Interactive Modeling and High Performance Simulation

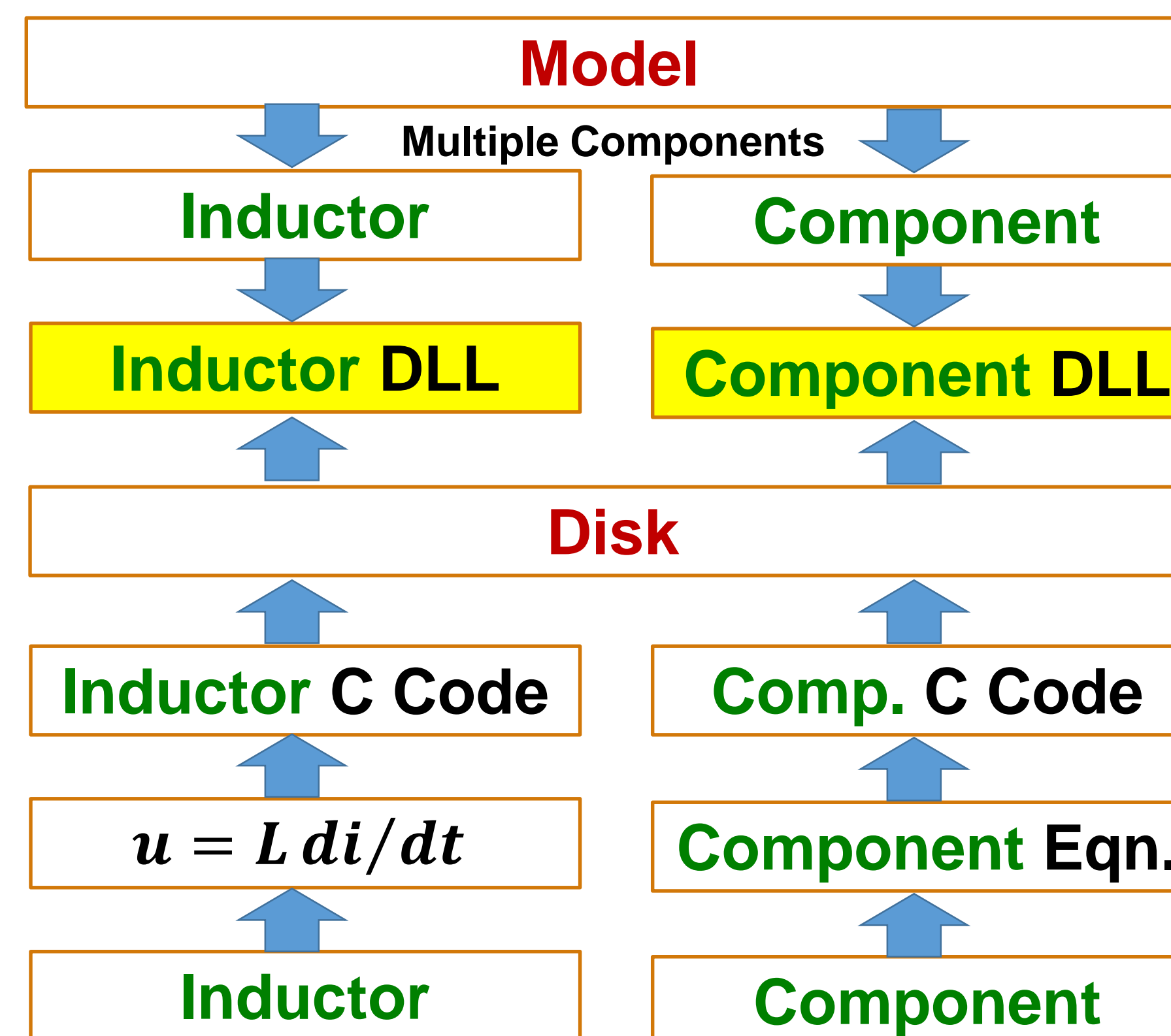


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An Example of Interactive Modeling

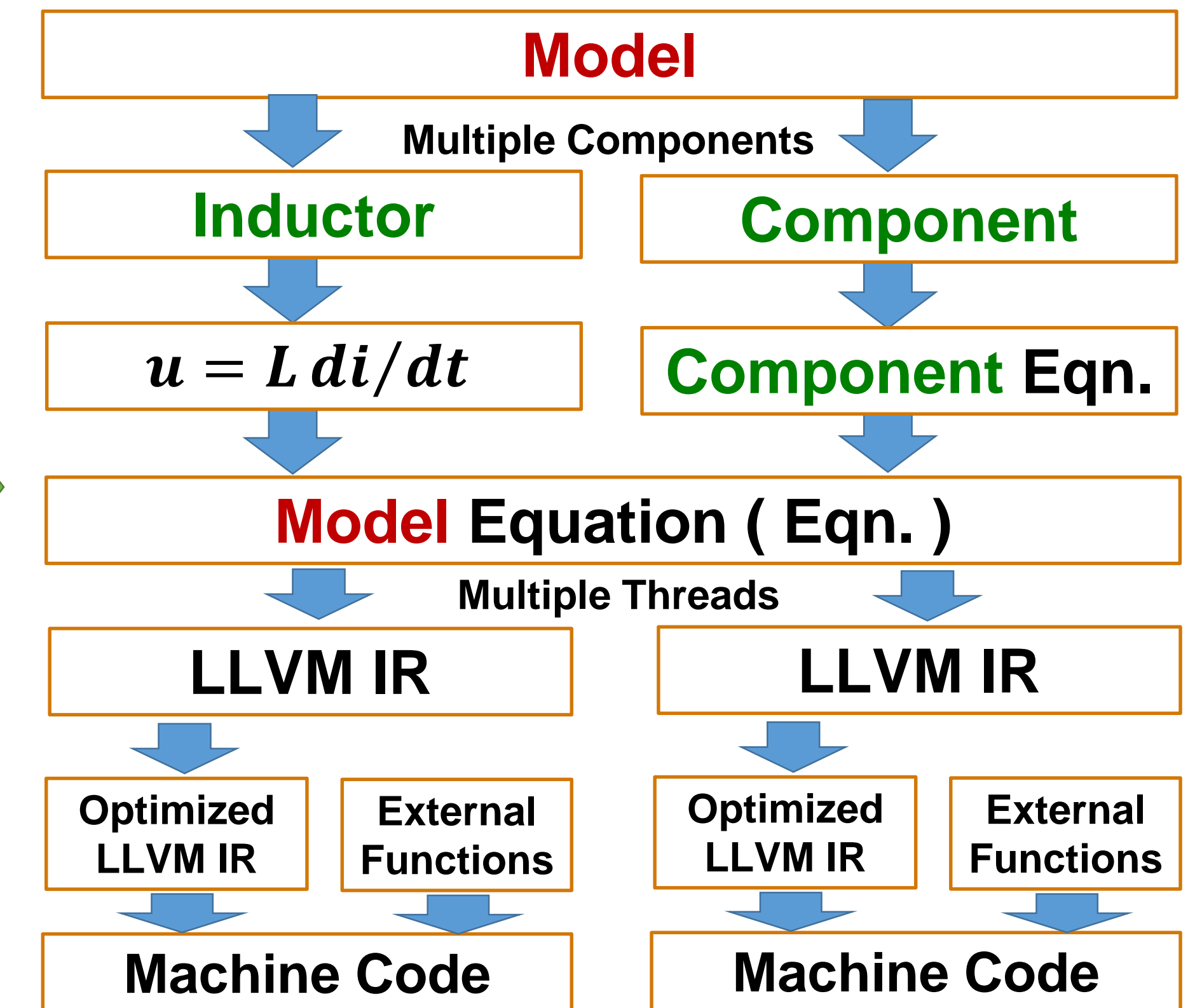


Shared Library-Based Simulation



- High cost interactive modeling due to shared library related disk IO
- Locally Optimized execution code because loss of equation and IR information prevents global model optimizations

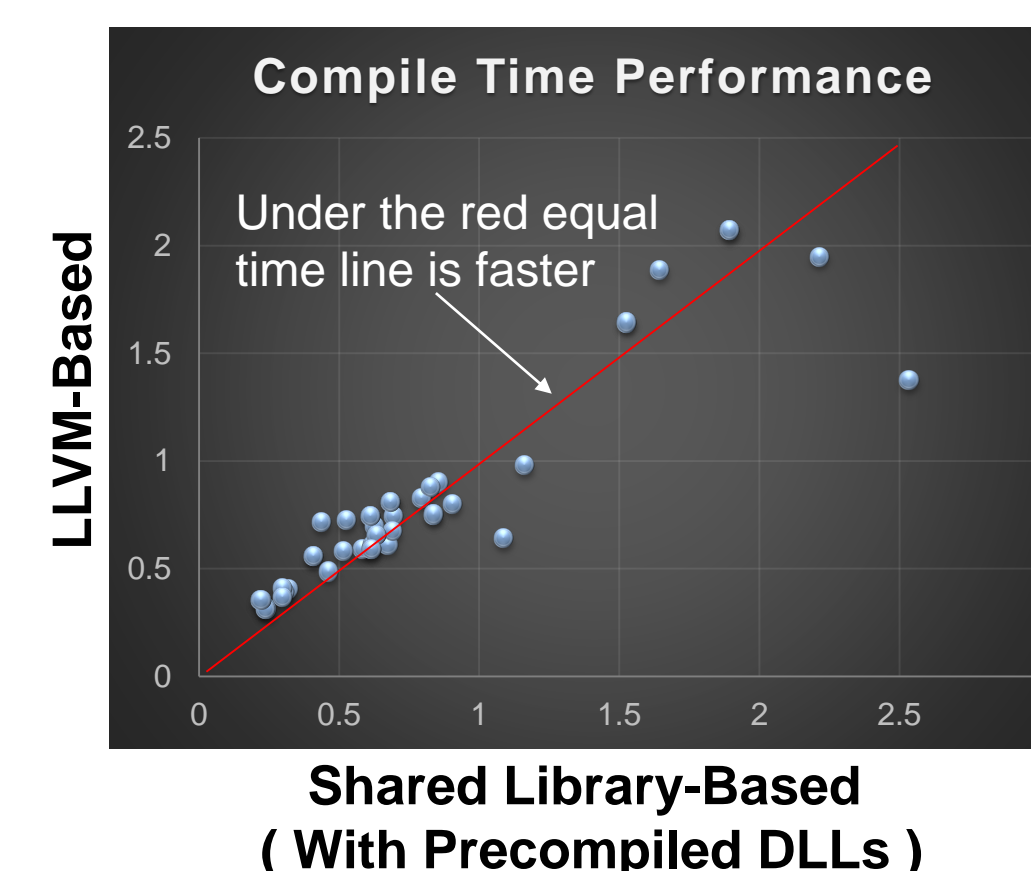
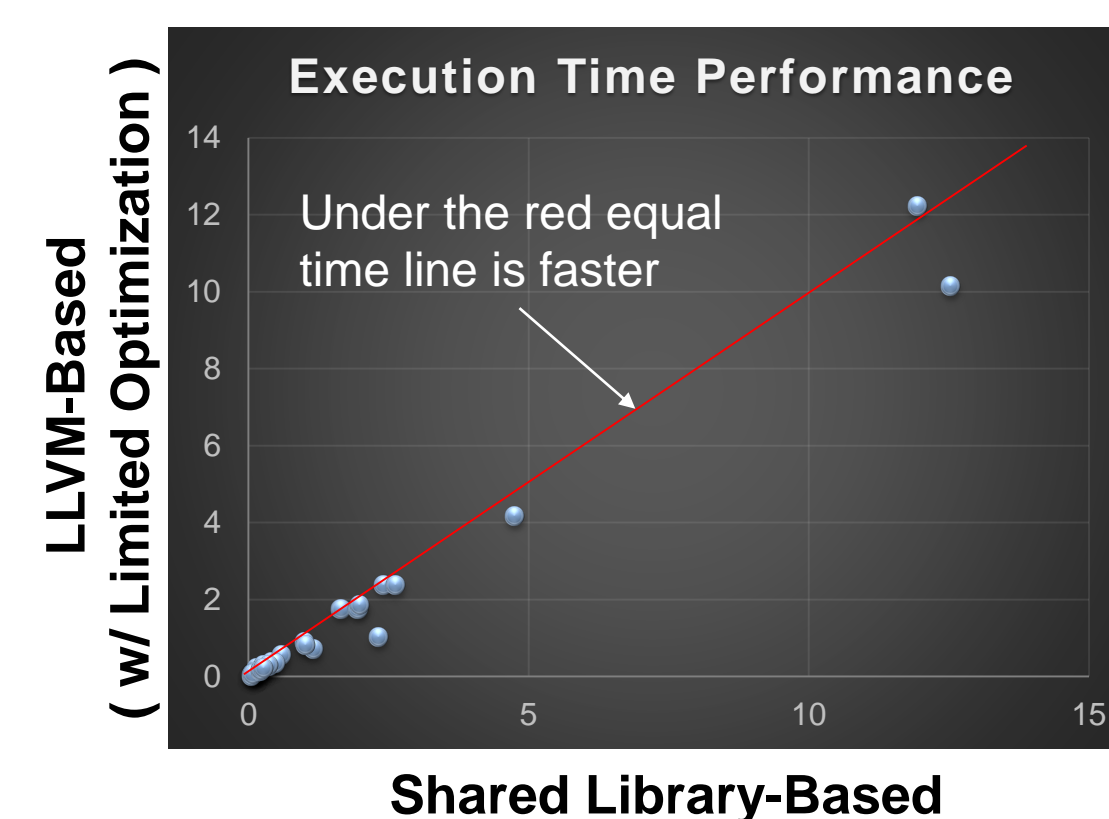
Multi-Thread LLVM-Based Simulation



- Low cost interactive modeling because there is no disk IO in compilation
- Globally optimized execution code due to global model optimizations in both the model equations and the LLVM IR

Results

- LLVM-based JIT in production code
- Consistent floating point numerical computation
- Support multiple threads on 64bit Linux, 32bit and 64bit Windows, 64bit Intel Mac



Challenges

- Shared library support
- Faster JIT performance
- Propagate through JIT code the exception thrown from the external functions
- MCJIT transition