



# A Framework for Multi-platform Compilation of Real-Time Reactive Control Programs

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## Motivation

The module “Domain-specific Languages for Automation Control” of the Christian Doppler Laboratory for Automated Software Engineering targets on developing concepts, modeling and programming notations, as well as tools that empower domain experts as well as end users to build and adapt control programs in an intuitive and concise way. In this module a domain-specific programming language – called Monaco – has been developed, which is a language for event-based, reactive machine control programming. It is intended to serve as a basis for end-user programming systems.

Currently, Monaco programs are translated into an internal representation (CodeDOM), which is interpreted by a virtual machine. In order to satisfy real-time constraints, a compiler framework for translating Monaco programs directly to machine code should be developed. The compiler framework should support translation of Monaco programs to different target platforms. Additionally, the compilers should enable modifications of Monaco programs at run time (e.g., replacing certain routines with others, which is a necessary requirement in our domain) while still preserving real-time properties.

## Work packages

- Literature study on
  - compiler frameworks
  - compilation of real-time reactive programs
- Design of a compiler framework
- Realization of the compiler framework
- Realization of a compiler for at least one platform
- Test
- Documentation

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