

RobMoSys meets CASM

(Project Ideas Pitch)

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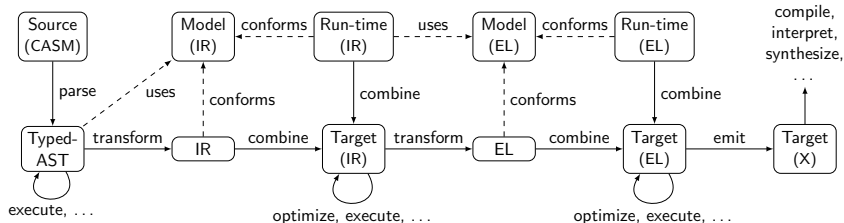
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Why CASM and what's (C)ASM?

- ▶ Abstract State Machine (ASM)
 - ▶ Generalized finite state machine over arbitrary data structures
 - ▶ Rigorous formal method for specification and refinement
- ▶ Corinthian Abstract State Machine (CASM)
 - ▶ Research project (will be open-sourced as GPLv3, casm-lang.org)
 - ▶ Concrete ASM implementation and specification language [1]
 - ▶ Interpreter (fast numeric and symbolic execution) [2]
 - ▶ Compiler (optimization focused code generation) [2]
 - ▶ Retargetable/reusable infrastructure [3]



- ▶ RobMoSys composition-structures (meta-models) in CASM
 - ▶ Specification and abstraction of blocks, component, activity, task, communication, sensors, services etc.
 - ▶ Simulation of robotic processes and interactions
 - ▶ Equivalence checking of different representations (of other tools?)
- ▶ RobMoSys task execution and behavior specification in CASM
 - ▶ Use of ASM built-in notion of parallel and sequential execution semantics to express understandable robotic interactions
 - ▶ Retargetable artifacts of task/activity/process specification to native source code or other (robotic) DSLs

- ▶ Advantages of using CASM in RobMoSys
 - ▶ Precise formal method to specify structural and behavioral (hierarchical) composition
 - ▶ Platform and technology independent (software) system specification with focus on reuse, retarget and refinement abilities
 - ▶ Analyzable with any rigorous form of verification and validation
- ▶ Proposal & Project Partners
 - ▶ Current idea: University of Vienna (UNIVIE) and 1-2 companies (one Austrian company possible?)
 - ▶ Are companies present in the room, which are interested to be partners of our proposal?

Thank you for your attention!

References

- [1] R. Lezuo, G. Barany, and A. Krall, "CASM: Implementing an Abstract State Machine based Programming Language," in *Software Engineering (Workshops)*, pp. 75–90, 2013.
- [2] R. Lezuo, P. Paulweber, and A. Krall, "CASM - Optimized Compilation of Abstract State Machines," in *SIGPLAN/SIGBED Conference on Languages, Compilers and Tools for Embedded Systems (LCTES)*, pp. 13–22, ACM, 2014.
- [3] P. Paulweber and U. Zdun, "A Model-Based Transformation Approach to Reuse and Retarget CASM Specifications," in *Abstract State Machines, Alloy, B, TLA, VDM, and Z - 5th International Conference, ABZ 2016*, Lecture Notes in Computer Science 9675, pp. 250–255, Springer, 2016.