

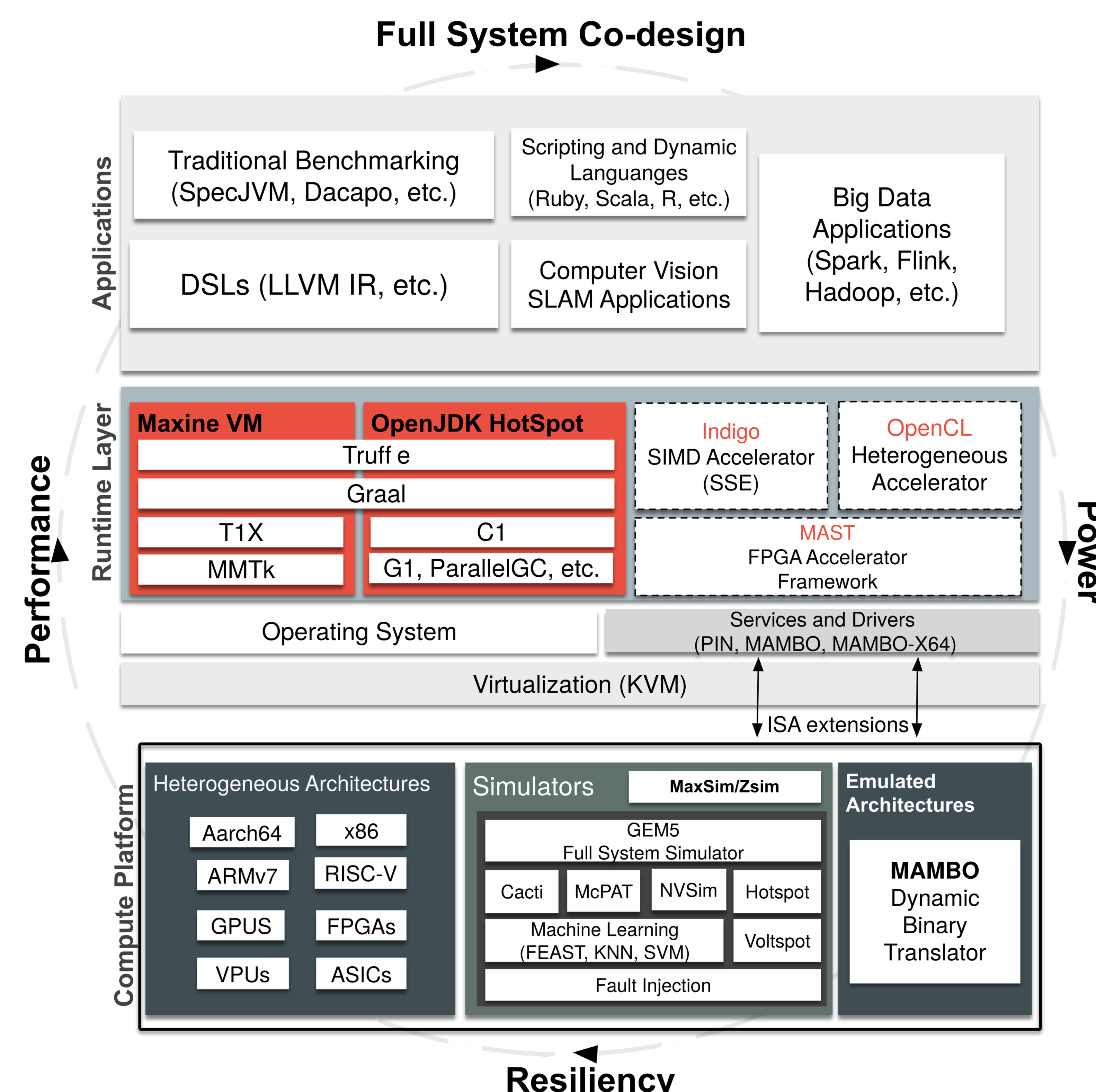
INTRODUCTION

- Managed runtime systems dominate user-friendly programming languages
- RISC-V J-Extension Working Group is focused on providing extensions for managed, interpreted and JIT-ed languages
- Currently the only JVM capable of executing (some) Java workloads on RISC-V is JikesRVM
- More VMs are needed to explore optimizations and evaluate their impact

MAXINE VM

- Meta-circular VM (Java VM written in Java)
- Multiple JIT compilers (T1X, C1X, Graal)
 - JVMCI Compatibility
- Multiple GC algorithms
 - MMTk Integration
- Multiple ISAs
 - X86_64, ARMv7, Aarch64
- Cross-ISA testing framework [1]
 - Allow porting of compilers on new ISAs through cross-compilation and simulation
- Integration with ZSim in MaxSim [2]
- Part of the Beehive ecosystem [3]

THE BEEHIVE ECOSYSTEM

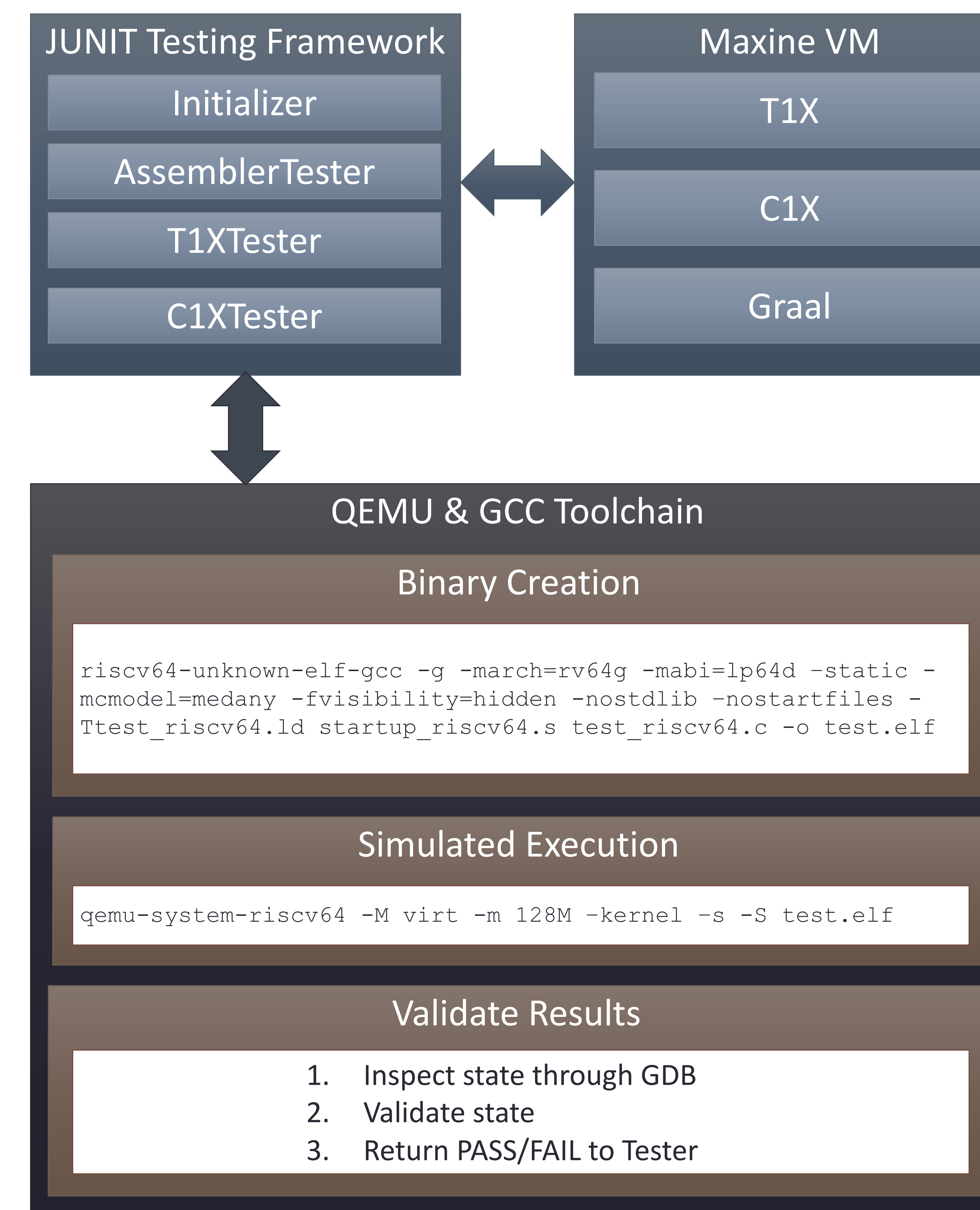


Beehive Characteristics:

- Modular and easily extensible
- Implemented with high-level languages with good IDE support and low entry-barrier
- Realistic and diverse simulation infrastructures
- Support of multiple hardware architectures
- Support of heterogeneous systems
- Capability of implementing multiple languages
- Integration with popular research tools

MAXINE VM RISC-V STATUS

- Ported Cross-ISA Testing Framework
- Created RISC-V Assembler Skeleton
- Active assembler development



CONTACT

All software is open-source:

<https://github.com/beehive-lab>

We welcome external contributions!

Please contact:

christos.kotselidis@manchester.ac.uk



[1] C. Kotselidis, A. Nisbet, F. S. Zakkak, N. Foutris. Cross-ISA debugging in meta-circular VMs. In VMIL 2017.

[2] A. Rodchenko, C. Kotselidis, A. Nisbet, A. Pop, M. Lujan. MaxSim: A simulation platform for managed applications. In ISPASS 2017.

[3] C. Kotselidis, J. Clarkson, A. Rodchenko, A. Nisbet, J. Mawer, M. Luján. Heterogeneous Managed Runtime Systems: A Computer Vision Case Study. In VEE 2017.