

# Language Workbenches: Opportunities and Challenges for V&V

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Language workbenches (LWBs) are tools that support the efficient construction of languages. Several LWBs support modular extension and composition of languages, as well as flexibly mixing diverse notational styles in a single model. This has obvious advantages for V&V: languages of different levels of abstraction and levels of formality can be integrated, verification-specific extensions can be modularly introduced and validation is more efficient because programs can be much more readable as a consequence of domain-specific notations.

But there are also challenges:

- How can verification tools deal with (potentially unknown) extensions to the subject languages?
- Can the semantics implied by language extensions be exploited to speed up the verification?
- Can the semantics of extensions be proven to be equivalent to their lower-level representation?

In this talk I illustrate the opportunities and challenges based on `mbeddr`<sup>1</sup>, an extensible set of integrated languages for embedded software development built with the JetBrains MPS language workbench.

My hope is that the opportunities help establish LWBs as a tool in the V&V community, and the challenges inspire discussions in the workshop and research after the conference.

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<sup>1</sup> <http://mbeddr.com/>