

Model-View-Update-Communicate: Session Types Meet the Elm Architecture (Artifact)

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Abstract

Model-View-Update (MVU) is a development pattern for user interfaces pioneered by the Elm programming language. In the accompanying paper, we show a theoretical model of MVU, and detail how it can be extended to support session-typed communication.

This artifact consists of a Docker image which contains a version of the Links programming language, equipped with an MVU library supporting session-typed communication. The implementation is showcased by all examples provided in the paper, alongside larger examples including a two-factor authentication workflow and multi-room chat server.

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Keywords and phrases Session types, concurrent programming, Model-View-Update

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Related Article Simon Fowler, "Model-View-Update-Communicate: Session Types Meet the Elm Architecture", in 34th European Conference on Object-Oriented Programming (ECOOP 2020), LIPIcs, Vol. 166, pp. 14:1–14:28, 2020. <https://doi.org/10.4230/LIPIcs.ECOOP.2020.14>

Related Conference 34th European Conference on Object-Oriented Programming (ECOOP 2020), November 15–17, 2020, Berlin, Germany (Virtual Conference)

1 Scope

Along with the formal definitions and semantics, the paper claims that the techniques have been implemented in the Links programming language. This artifact contains that implementation, along with the larger examples mentioned in the paper. Additionally, the artifact contains Links implementations of all examples used in the paper.

2 Content

The artifact is a Docker image.

The artifact package includes:

- A `README.md` file which documents the artifact contents in more depth; provides setup instructions; and provides an evaluation workflow
- A copy of the Links source code, including the linear MVU library
- Links implementations of all examples included in the paper

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3 Getting the artifact

The artifact endorsed by the Artifact Evaluation Committee is available free of charge on the Dagstuhl Research Online Publication Server (DROPS).

4 Tested platforms

This artifact has been tested by the author to work on Arch Linux, using Docker version 19.03.8-ce, build afacb8b7f0. It should not require large amounts of memory or processing power.

5 License

The artifact is available under the MIT license.

6 MD5 sum of the artifact

103bcb663293d8fbbd1917d0dce292b5

7 Size of the artifact

25.6 MB

References

- 1 Simon Fowler, Sam Lindley, J. Garrett Morris, and Sára Decova. Exceptional asynchronous session types: Session types without tiers (companion artifact). doi:10.1145/3291617.