A Functional Event-Driven Framework

Christopher William Schankula, Spencer Smith,
Christopher K. Anand[†]
{schankuc, smiths, anandc}@mcmaster.ca

[†]Department of Computing and Software, McMaster University https://stablfoundation.org, http://outreach.mcmaster.ca

November, 2024

Background

Elm is a **strongly-typed, pure functional programming language**. It is used to create type-safe front-end web applications, but concurrent applications require writing separate server code and client-server communication code. This project explores **serverless development** in Elm, and its effect on the engagement of new programmers.

Novel Architecture

- Builds on Elm's MVU, with a local (private) and global (shared) model and update

Figure 1: A two-client dataflow diagram of the Local-Global Model-View-Update Architecture. Each client has its own local model (top and bottom band), and all clients share a global model (middle band).

Conclusions & Future Work

Leveraging the strictly-typed nature of Elm and its MVU architecture, we were able to create a **simplified multi-user framework**, with no application-specific server-side code. First-year students were able to create **complex multiplayer games** and surveyed students reported a high level of enjoyment. Ongoing work includes formalizing visual models for creating TEASync applications.

Acknowledgments

We thank NSERC for CGS-M funding and the Government of Ontario for OGS funding. Thanks to CS 1XD3 group 42 (*) for allowing inclusion of their apps as an example. Special thanks to Denise Geiskkovitch for helping with the usability and engagement study.