

Report on the outcomes of a Short-Term Scientific Mission¹

Action number: CA20111

Grantee name: András Kovács

Details of the STSM

Title: Evaluation efficiency in cubical type theories

Start and end date: 09/10/2022 to 16/10/2022

Description of the work carried out during the STSM

Description of the activities carried out during the STSM. Any deviations from the initial working plan shall also be described in this section.

(max. 500 words)

During the visit I did the following work:

1. Worked on the prototype implementation of a cubical type theory together with Anders Mörtberg.
2. Worked with Anders and also with Evan Cavallo on specifying and verifying the computation rules that we would like to implement.

Description of the STSM main achievements and planned follow-up activities

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

(max. 500 words)

During the visit, we have made significant progress in two ways:

- We wrote significant amount of code for the prototype implementation. We also improved on the basic

¹ This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

design and structure of the prototype. I note that we did not have a working implementation at the end of the visit, simply because of the amount of the required work to get to that stage.

- Based on the suggestion of Evan Cavallo, we reviewed a new set of definitions for univalence, which seems to be an improvement on all the existing cubical type theory implementations.

We have agreed on the following follow-up activities:

We will continue to develop the implementation until it can run benchmarks. When we reach that stage, Anders & collaborators will adapt existing benchmarks to the system. System development will be mostly done by me, and benchmark authoring by Anders & co.