Short-Term Scientific Mission Grant

- APPLICATION FORM[1] -

Action number: CA20111

Applicant name: Amélie Ledein

Details of the STSM

Title: Rechecking KProver proof objects into Dedukti

Start and end date: 04/07/2022 to 17/07/2022

Goals of the STSM

Purpose and summary of the STSM.

This STSM aims to consolidate scientific interactions started online in 2021. Our first exchanges led to a first prototype of a translator from K to Dedukti, but this STSM would allow us to start a new objective: to verify with Dedukti the proof objects of the KProver.

To achieve this goal, two approaches are possible:

- directly use the trace generated by the KProver,

- using the Metamath translation of the trace generated by the KProver.

We consider the 1st solution, the 2nd one being less reliable, less independent, and probably requiring little help from the K team, especially from Dorel Lucanu and Traian Florin Șerbănuță.

Working Plan

Description of the work to be carried out by the applicant.

The candidate is a PhD student from Deducteam who has already developed a first prototype to translate K semantics into Dedukti.

Here, the work to be done by the candidate consists in developing a first prototype allowing, from the trace generated by the KProver, to generate proof objects allowing Dedukti to double-check the proofs established by the KProver.

1 This form is part of the application for a grant to visit a host organisation located in a different country than the country of affiliation. It is submitted to the COST Action MC via-e-COST. The Grant Awarding Coordinator coordinates the evaluation on behalf of the Action MC and informs the Grant Holder of the result of the evaluation for issuing the Grant Letter.

This work will thus rely on the knowledge acquired during the realization of the translator from K to Dedukti, but will also require to exchange with the K team to understand the trace generated by the KProver. This new prototype is also an opportunity to test the trace generated by the KProver, by ensuring that another formalism very different from Metamath is also able to verify the proof established by the KProver.

Expected outputs and contribution to the Action MoU objectives and deliverables.

Main expected results and their contribution to the progress towards the Action objectives (either research coordination and/or capacity building objectives) and deliverables.

The objective of this mission is to develop a translator of KProver proof objects into Dedukti, in order to be able to double-check them.

It will consolidate existing scientific interactions, but also facilitate exchanges on more technical details.

This work is a first step towards the interoperability of KProver proofs with other formal tools, and the writing of an article following this mission is envisaged.