

Short-Term Scientific Mission Grant - APPLICATION FORM¹ -

Action number: CA20111

Applicant name: Alexander Steen

Details of the STSM

Title: Infrastructure for Automated Theorem Provers Inventory

Start and end date: 14/03/2022 to 20/03/2022

Goals of the STSM

During this 7-day STSM, the fundamental requirements of an automated theorem proving inventory will be discussed and documented. The goal is to propose a schema for systematically listing and categorizing available theorem proving systems, their proof formats and their underlying methods; a process how to involve the community in building the inventory in a collective effort; and an appropriate representation format for the published inventory.

Working Plan

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

The applicant (primary expertise: Theorem Proving systems for higher-order logics) will collaborate with Pascal Fontaine (primary expertise: Automated Reasoning in SMT) at U Liege.

The STSM working plan (7 days) is structured as follows:

- Day 1-3: Literature study, discussion and documentation of inventory requirements
- Day 4-5: Discussion, design and documentation of processes for managing, maintaining and extending the inventory.
- Day 6-7: Selection of exemplary theorem proving systems; creation of preliminary inventory entry draft for them.

The exemplary theorem proving systems to be processed will be selected by their contemporary usage in the community, with a focus on selecting at least two or three fundamentally different systems.

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.

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.

Within the scope of the proposed STSM, the following three outputs will be generated:

1. A short technical report on the requirements and proposed design of an inventory for Automated Theorem Provers.
2. An preliminary inventory consisting of selected theorem proving systems (for illustration purposes).
3. A concept including process description on how to activate and include the automated reasoning community to collaboratively curate and extend the inventory.

These outputs constitute necessary prerequisites of deliverable D3 (month 18). The STSM hence contributes to the short term scientific impact "A deeper understanding of features of theorem provers" as well as the short term technological impact "Tools allowing the translation of proofs between different systems.". The final inventory will display features of different theorem proving systems in a systematic manner and act as reference point to understanding the available ecosystem of theorem provers (and thus contribute to the former objective). Moreover, the inventory will also allow the action to identify relevant theorem proving systems as targets for the proof translation efforts (latter objective).

The idea is generate momentum such that further work towards goal D3 can easily be contributed by further parties.