

Short-Term Scientific Mission Grant - APPLICATION FORM¹ -

Action number: CA20111

Applicant name: Frédéric Blanqui

Details of the STSM

Title: Translating HOL4 proofs to Dedukti and Lambdapi

Start and end date: 22/05/2023 to 26/05/2023

Goals of the STSM

Purpose and summary of the STSM.

(max.200 word)

The goal of this STSM is to learn with my host Magnus Myreen, one of the main developers of the proof assistant HOL (<https://hol-theorem-prover.org/>), how HOL works and is implemented. Indeed, to translate HOL proofs to Dedukti and Lambdapi, it is necessary to first generate and extract those proofs. HOL is similar to HOL-Light: no proof terms are built internally. Instead it uses an abstract data type for proved statements. To generate proofs, it is thus necessary to instrument the HOL kernel itself, and some basic tactics too. Without the help of a HOL developer, it will be difficult and time consuming.

Working Plan

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

(max.500 word)

Magnus Myreen will first explain to me how HOL works and is implemented, and where to find the different HOL libraries and how they are organised. I will then try to reuse my development for translating HOL-Light proofs to Dedukti and Lambdapi, <https://github.com/Deducteam/hol2dk>, to develop a similar tool for HOL.

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.

(max.500 words)

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.

Expected output: a first tool prototype to translate proofs from HOL to Dedukti and Lambdapi.

Contributions to the action: proof system interoperability is the main goal of EuroProofNet. More specifically, this STSM will contribute to the following objectives and deliverables:

Research Coordination Objectives:

1. Express new proof systems in the Dedukti logical framework.

Capacity Building Objectives:

1. Bring together members of the different communities working on proofs in Europe.
3. Create an excellent and inclusive network of researchers in Europe with lasting collaboration beyond the lifetime of the Action.