

Short-Term Scientific Mission Grant - APPLICATION FORM¹ -

Action number:

Applicant name:

Details of the STSM

Title: Translation from Dedukti to Minlog

Start and end date: 05/02/2023 to 12/02/2023

Goals of the STSM

Purpose and summary of the STSM.

Our long-term goal is to develop a translator from an encoding of the Predicate Logic in Dedukti to Minlog. Then, this translator could be used to help exporting proofs to Minlog. As an example, the proofs of the propositions in Euclid Book I of the library Geocoq [1] (that have been obtained in this encoding [2]) would be translated in Minlog. Besides, we will investigate the links between Minlog and Dedukti, especially in terms of rewriting rules and see how the encoding of the Predicate Logic is well-suited to the translation to Minlog.

[1]: <https://geocoq.github.io/GeoCoq/>

[2]: https://github.com/Karnaj/plth_geocoq_euclid

Working Plan

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

The activities will depend on how much I will be able to progress before the visit. For now, I plan to present how we obtain the propositions in Euclid Book I, and how we managed to minimize the theory where the proofs are expressed (from the Calculus of Constructions to Predicate Logic. This minimization work is quite important since it will permit to export libraries from a system S1 to a system S2 that implements a less powerful logic.

The next step would be to study the theory of Minlog and to compare it to the encoding of the Predicate Logic. In particular, Dedukti and Minlog have rewriting rules, and we will compare them: these rules are used to encode the Predicate Logic and this use could be difficult to translate.

And finally, the final step is the implementation of the translator. A first approach is to

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.

translate the proof terms. But, the long-term objective is to write a translator whose outputs uses the language of Minlog, thus to obtain readable outputs.

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.

This STSM is mainly linked to WG1 since the long-term goal is to implement a tool for interoperability. The main contribution will be the implementation of a tool to export from Dedukti to Minlog, and to use the example of Euclid Book I as an illustration. However, this work seems too important to be completed during the mission. Besides, we expect to have

- (i) a clear vision of the differences/similarities of Minlog and Dedukti (especially about the rewriting rules)
- (ii) a clear vision of the translation process, and maybe the beginning of the tool.