

Report on the outcomes of a Short-Term Scientific Mission¹

Action number: CA20111

Grantee name: Temur Kutsia

Details of the STSM

Title: Exploring anti-unification over typed languages and equational theories

Start and end date: 23/02/2025 to 02/03/2025

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)

We proceeded according to the initial plan: there were no deviations. We held daily meetings with David (including Saturday, March 1) at the Institute of Computer Science, discussing various aspects of anti-unification in higher-order, equational, and quantitative theories. Among the outcomes of these meetings we would like to highlight the following:

A draft of generalization algorithm for the Lambda P calculus, which is restricted to the top-maximal shallow variant. This variant has some nice properties wrt generalization type in the simply-typed case, and we hope to carry over them to dependent types.

A better understanding of the generalization problem in the quantitative setting and a proposal for a class of quantitative equational theories where generalization would be finitary.

Analysis of types of equational generalization problems in ground theories, and the development of a collection of anti-unification problems that exhibit interesting relation between linear and general solutions to generalization problems. (It should be mentioned that in this case our original hypothesis turned out not to be true and we had to revise it. The revised one is still to be proved.)

¹This 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.

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)

There are plans for joint publications, which would involve also other collaborators of David Cerna and Temur Kutsia from Austria, Brazil, and France. During the visit we have been in online contact with them. This is an ongoing collaboration which will continue in the future. Targeted venues for the joint publications are the main journals and conferences in our area (e.g., ACM Transactions on Computational Logic, Journal of Automated Reasoning, Journal of Symbolic Computation, IJCAR/CADE, FSCD, CICM, FOSSACS, ...). As mentioned in the proposal, generalization techniques addressed in this STSM are relevant for WG6, WG4, and WG2 with possible applications in, e.g., proof similarity detection, compression, lemma extraction, etc.

Signature:



Host: David Cerna

Date: 06.03.2025