Report on the outcomes of a Short-Term Scientific Mission[1]

Action number: CA20111, STSM 387213

Grantee name: Peter LeFanu Lumsdaine

Details of the STSM

Title: Comparing notions of dependent algebraic theory

Start and end date: 18/03/2023 to 25/03/2023

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.

The STSM visit was generally successful, making good progress towards the joint paper in preparation with Ahrens and North. Unfortunately two days' work were lost due to illness midweek, but the rest of the week was fruitful and productive. Besides the collaboration on the paper, I spoke on Monday in the DutchCats seminar at Utrecht University, and benefited from fruitful discussions with the other local participants and visitors.

As described in the STSM proposal, the aim of the paper is to methodically survey a topic on which several different approaches exist in the literature, but whose comparisons are known only in folklore (if at all). A large part of the work during the visit thus consisted of literature review, ensuring that we are taking into account all relevant existing work. In parallel with this, we worked on fleshing out the missing comparisons between notions, within the framework of 2-category theory.

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.

During the visit, we completed a thorough literature review, and started distilling it into an annotated bibliography to accompany the paper. On the main content of the paper, we successfully fleshed out our initial skeleton into a detailed draft, including most of the hoped-for clarifications of connections between different existing notions of dependent algebraic theory, and proceeding with the careful (2-)category-theoretic analysis of their relationships.

It remains to work out some further questions regarding the 2-categorical relationships between notions, and complete the formal write-up of the results.

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[1] This 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.

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