

## Report on the outcomes of a Short-Term Scientific Mission<sup>1</sup>

**Action number: CA20111**

**Grantee name: Gergely Buday**

### **Details of the STSM**

Title: A bootstrapping verified compiler for a concurrent functional language: the design

Start and end date: 11/04/2022 to 15/04/2022

### **Description of the work carried out during the STSM**

I talked at a seminar at the LASIGE research group. I described the background of my work, Reppy's Concurrent ML programming language and Myreen's minimal bootstrapping compiler. The latter is a starting point artefact on which I can base my work: writing a verified bootstrapping compiler for a concurrent functional language. The former, Concurrent ML is a motivating example of what a concurrent functional language can do. In my lecture I sketched a plan on how I would design my compiler.

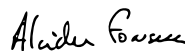
I got appraisal and serious criticism on my talk. My audience liked the idea of this verified compiler. Prof. Vasco Vasconcelos was highly skeptical of having Concurrent ML as a starting point: he said it is not used and it is a rather old idea. He suggested to look at Go which is used extensively for concurrent programming. I should take Go into account, even if I stick with the Concurrent ML-like concurrency: the fact that it is used widely for concurrent programming can give me ideas for case studies in my dissertation.

Another day I visited Dr. Antonio Ravara's group at the NOVA University in Lisbon: there was a seminar and Luís Cruz-Filipe was talking about his work on the verification of concurrent coordination languages. This topic is important for my research and these people are also part of WG3, the Program Verification Working Group of EuroProofNet. After the talk we had a long discussion on concurrent programming.

Dr. Fonseca, Prof. Vasconcelos and Dr. Ravara raised my attention to the importance of session types in concurrency, e.g. the FreeST session-typed programming language that is an active area of research in Lisbon.

### **Description of the STSM main achievements and planned follow-up activities**

Other than my talk I discussed my research and our collaboration in great detail with Dr. Alcides Fonseca, including concurrency primitives in low-level programming. We agreed on a weekly video call to evaluate my advance in this research and set up a short-term plan on how to continue my research.



<sup>1</sup> 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.