

Report on the outcomes of a Short-Term Scientific Mission¹

Action number: CA16228

Grantee name: Dr. Karolina Vocke

Details of the STSM

Title: Research stay at KRTK

Start and end date: 31/01/2022 to 13/02/2022

Description of the work carried out during the STSM

I stayed two weeks at the KTI and the Corvinus University of Budapest following Péter Biró's invitation to work with him on stability concepts in large matching markets. Among other topics in matching theory, we worked on the connection between concepts of stability in large networked many-to-many matching markets and fractional stability in hypergraphs. In this time, we managed to understand the differences and connections between these two concepts.

In these two weeks in Budapest, I had the precious chance to work together with Peter Biro every day. Typically meeting every morning at the KTI, we discussed various topics on networked matching theory and raised open questions. I got an insight in his projects on school choice, kidney exchange, core concepts in matching markets with lexicographical preferences and market design et al. It was a very inspiring stay, generating many new ideas and a new perspective on how to look on matching markets from a more computational viewpoint.

In the first week I had the opportunity to present my project on tree-stability in large matching markets at the KTI seminar. I was grateful to have the chance to discuss my work with leading researchers in this field as Tamás Fleiner, Péter Biró and Zsuzsanna Jankó, among others. I also attended another KTI seminar in the second week.

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.

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

In the time in Budapest, next to many other things, we could better understand the differences and connections between concepts of stability in large networked many-to-many matching markets and fractional stability in hypergraphs. Next to the difference in interpretation (a continuum of agents in one model, an intensity of interaction in the other) the main difference is, that fractional matchings in a many-to-many setting are suited to analyse substitutable preferences. In this setting individual (possibly multilateral) contracts (and not sets of contracts) are signed with a certain fraction/intensity. While large markets can also be used to deal with general choice functions on sets of (multilateral/bundled) contracts. Here for every type, there is a continuum of agents who each can sign any set of contracts. In this sense some of the results on the existence of stable outcomes in the model in (JV 2021) are more general, while the computational complexity results in the fractional matching model (see Biró 2007) are very strong and could also be applied to the large market setting. We hope to continue the collaboration and deepen the understanding, possibly starting a joined project on this or a related topic.