

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

**Action number:** CA18232, Mathematical models for interacting dynamics on networks

**Grantee name:** Ioan Liviu Ignat

## **Details of the STSM**

### **1.1. Title: Discrete operators on metric graphs**

Start and end date: 11/06/2023 to 19/06/2023

## **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.

*(max. 500 words)*

During my visit to Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague, I gave a talk entitled "Asymptotic behaviour of solutions for some diffusion problems on metric graphs" ( <http://mafia.fjfi.cvut.cz/index.php?str=seminar> ). Our mathematical research was concentrated on the study of some discrete models/operators on metric graphs/trees. We also considered some shape optimization problems on lattice domains intimately related with the discrete operators. For example one wants to know what is a connected set of unit squares with area  $A$  having the minimal perimeter. It is related with subgraphs of  $Z^n$  endowed with some infinity norm distance. Some partial results have been obtained.

## **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)*

The initial goals and the expected outcome have been archived: we have some common problem to finish in the near future and to submit a paper to an international journal. One talk has been delivered in

<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.

Prague. I interacted with other members from the department in Prague. We decided to continue our collaboration and to visit each other either in Bucharest or in Prague in the next year. My student Dragos Manea, also member of the COST action, will be involved in the joint work.