

Widening Country Inspiration Story

“The critical factor is finding a vibrant, goal-oriented environment with similar ideas.”

Organisation name: Nicolaus Copernicus University in Toruń
Organisation type: Higher education organisation
Country: Poland
Project Acronym: MOSAIC
Project start and end date: 1.09.2021 - 30.04.2026
Type of MSCA, Horizon 2020: Research and Innovation Staff Exchange
Is your organisation a coordinator? No



What is your project about?

The project concerns a specific area of logic known as modal logic, which has been a thriving area of theoretical research since the 1960s. Roughly speaking, modal logic examines various phenomena related to reasoning involving possibility and necessity, knowledge and belief, provability, computer programme execution, time flow, and spatial relations, to mention the most important ones. Investigations in the field usually have a twofold character: they can be related to purely mathematical aspects of modal logic or to its applications in knowledge representation, legal reasoning, data privacy and security, and natural language analysis. The project delves into both branches, developing new mathematical tools that give insight into the foundations of modal logic and applying them to the analysis of real-world phenomena. The research outcomes are mainly theoretical. It could appear difficult to envisage its direct impact beyond logic itself. However, modal logic has been applied to the assessment of traffic light

control systems or analysing computation pathways during the execution of computer programmes, meaning it can have both a theoretical and practical application.

Why is your project important for society?

In the last twenty-five years the information explosion gave us several unpredictable developments, such as social media, databases of gargantuan proportions (big data), deep learning, large language models, artificial intelligence, ubiquitous robots, sophisticated GPS systems, autonomous cars, and worldwide conspiracy theories. What unites these phenomena is that they either process information in the sense of drawing pieces of information from others (i.e., reason in a very abstract sense of the word), result from information

processing, or stock vast amounts of information. Modal logic provides tools to verify the correctness of information processing, to check its consistency, or describe the underlying structure of information storage. As the world speeds up, the existing tools need to be enhanced, and new ones should be developed. Positive outcomes allow for the description and understanding of critical aspects of the phenomena mentioned above, globally or locally. This is a crucial aspect of the project from the point of view of societal benefits.

What kind of support did you get?

The application was prepared by Tommaso Flaminio and his collaborators from the Artificial Intelligence Research Institute of the Spanish National Research Council (IIIA - CSIC) in Spain, with the cooperation of local project coordinators from participating units. The experience gained by some of the participants during the implementation of the earlier [MSCA Research and Innovation Staff Exchange SYSMICS](#) project and their assistance played a vital role in preparing the successful application on all possible levels. For us and the unit in which we work, applying for and participating in an MSCA project has been a novel experience, and without assistance from more experienced friends and colleagues, we would have found it much more challenging to take part in such an endeavour.

What tips can you give other organisations that would like to apply for MSCA?

In terms of projects and applications there is no fixed path to success. The critical factor is finding a vibrant, goal-oriented environment with similar ideas. Ideally, the environment should involve

people who have experience with MSCA projects and are willing to show the ropes to others. Last but not least, being in the right place at the right time may be the deciding factor. In our case, the MOSAIC participation began with the SYSMICS project's closing conference, at which two people from our research unit gave talks. One of us took part in a meeting whose goal was to come up with ideas for a new project. And here we are, participating in a worldwide research project at the forefront of logical investigations.

More information on the project:



The Marie Skłodowska-Curie Actions (MSCA) support researchers at all stage of their career across all disciplines. The MSCA also support cooperation between industry and academia and provide innovative trainings and career developments.

The MSCA Research and Innovation Staff Exchange (RISE) promotes international and cross-sector collaboration through exchanging research and innovation staff, and sharing knowledge and ideas from research to market (and vice-versa).

The MSCA-NET project is the MSCA NCP project to facilitate the transnational cooperation to achieve a consistent and harmonised level of NCP support. The scientific community can also profit from our project to support their MSCA application.

