What is the HERoS project about and how are you involved in this project? 

The HERoS project is an H2020 project funded in response to the Covid-19 outbreak. HERoS stands for Health Emergency Response in Interconnected Systems. We want to understand the Covid-2019 outbreak by understanding and orchestrating the many direct and indirect feedbacks between local systems, interventions and global impact across international supply chains. Therefore, HERoS takes an integrated perspective that aims at understanding the impact of these measures from the bottom up and orchestrates the response across hierarchical levels, sectors and countries. Within the project, I lead the work package on behavioural modelling and decision-making.

What is your research focus within this HERoS project? 

Epidemics, such as Covid-19, essentially spread through contact networks and human interaction. To consider the impact of local population structures and behaviour, we will develop an agent-based model at the level of cities. This model will be combined and coupled with a network model based on system dynamics to model the spread across globalised networks. To reflect on the tremendous uncertainties, we will use exploratory modelling to identify robust policies.

What will we learn from this research? 

This research will allow us to understand the impact of policy interventions locally at global level, and vice versa. At the same time, we will also aim to understand the balancing act of recovery and resilience: what is the implication of re-opening our cities and countries? How to avoid that the most vulnerable populations are specifically exposed? Which control mechanisms can be put in place to prevent another wave of the disease as we re-open our societies? And what is the role of local behaviour and culture? We also saw that many countries initiated serious restrictions only after the disease already had infected thousands of people. Therefore, another important question is: what are appropriate thresholds to initiate the protective measures (again) given the exponential spread of a disease?

What is your main challenge within this project? 

Access to the right amount and quality of data is always a challenge for us as computer scientists. Some social media platforms are the needs of their citizens during this crisis at any given time.

Are we going to notice this research project as ordinary citizens? 

Hopefully, by the end of HERoS, we would have succeeded in understanding and measuring approximately the impact of misinformation on this pandemic.

Are we going to notice this research project as ordinary citizens? 

Access to the right amount and quality of data is always a challenge for us as computer scientists. Some social media platforms where misinformation spreads wildly, such as WhatsApp, are private and therefore we will not be able to access that data with our research computer programs. The other challenge is that new rumours and myths about COVID-19 are emerging on daily basis, and therefore we would need to regularly update our databases and refresh our analysis to keep up to date.

Where is the HERoS project in 3 years? 

After three years, I hope that we have generated important insights that helped navigate the Covid-19 pandemic and contribute to avoid future epidemics from turning into pandemics. The World Economic Forum estimated last year that in the coming decades, epidemics will cause average annual economic losses of 0.7% of the global GDP. This puts the scale of loss associated to epidemics at the same level as the losses estimated for climate change. Understanding how to prevent future epidemics spread, understanding resilience, governance, supply chain management and information is therefore of the essence if we would like to avoid future pandemics.