

Report on the outcomes of a Short-Term Scientific Mission¹

Action number: CA19130

Grantee name: Cathy Yi-Hsuan Chen

Details of the STSM

Title: **Fintech disrupting financial services**

Start and end date: **1/10/2022 to 31/10/2022**

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)

First, we delineate and attribute, from a statistical and practical perspective, the unsatisfactory performance of Robo-advising portfolios during the pandemic period to the limitations of the current state-of-art Robo-learning approaches.

Second, we develop a novel Robo-advising framework that overcomes the bottleneck of Robo-learning under rare disasters.

Third, we simulate, under rare disasters, how the proposed learning framework remains robust and applicable for the Fin-Tech-relevant industries.

Last but not least, we measure the superior performance between our learning approach and other alternatives.

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)

Grantee enters max 500 word summary here.

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.

First, the intended STSM project empowers Robo- and AI-related applications, especially for learning that is subject to small samples and uncertainty. This achievement sustains one of the key Action objectives for minimising the disparity between the AI models and practices.

Second, the proposed SARSA-IS (the State-Action-Reward-State-Action combined with importance sampling) algorithm provides a computational framework that effectively deals with investing decisions under rare events.

Third, the usefulness and effectiveness of the proposed algorithm have been confirmed when exploiting the 2008 financial crisis and the COVID-19 pandemic data.

We show superior performance over the competing algorithms. The developed algorithm improves the transparency of AI-supported processes in the Fintech space.

Third, this STSM can be an excellent use case for FinTech-relevant projects and industries. The AI-enabled portfolios and the featured trading strategies benefit new start-ups and financial institutions. This achievement is clear evidence of how AI assists decision-making in investment and wealth management.

Last, the invented Robo-learning methodology will soon be disseminated to the COST action network to create its impact.

The STSM research outcomes have great potential for publication, especially for the Journals related to decision-making support systems, Machine learning, and AI applications.

To ensure the sustainability and applicability of the proposed AI method, the follow-up activities will be deploying the invented techniques into the FinTech-related industries and refining the algorithms if needed.