

日本—イスラエル 国際共同研究「レジリエントな社会のための ICT」 2020 年度 年次報告書	
研究課題名（和文）	観光客の流動パターンの把握と避難経路情報の提供
研究課題名（英文）	Tourists' Flow Patterns Identification and Information Provision for Safe Evacuation
日本側研究代表者氏名	Jan-Dirk Schmöcker
所属・役職	京都大学 工学研究科 都市社会工学専攻・准教授
研究期間	2018 年 6 月 1 日～ 2022 年 3 月 31 日

1. 日本側の研究実施体制

氏名	所属機関・部局・役職	役割
Jan-Dirk Schmöcker	Associate Professor, Kyoto University, Department of Urban Management	PI. Overall responsibility for the project from team Japan side. Involved particularly in the data modelling aspects.
Nobuhiro Uno	Professor, Kyoto University, Department of Civil and Earth Resource Engineering	Co-PI. Specifically overseeing the connection, the data collection aspects of the project.
Fumitaka Kurauchi	Professor, Gifu University, Department of Civil Engineering	Involved significantly in most parts of the project. Specific expertise in modelling with wifi-data as well as evacuation patterns.
Junji Nishida	Japan Research Institute for Social Systems	Overseeing technical aspects of experiments. Expertise in installing wifi-sensors.
Toshiyuki Nakamura	Associate Professor, Nagoya University, Institute for Innovation for Future Society.	Overseeing communication with Kyoto City as well as links to related projects on tourism in Kyoto.

2. 日本側研究チームの研究目標及び計画概要

Based on the results from the first two project years in 2020 we continue with evacuation scenario modelling. We will use the obtained data as input to model different evacuation scenarios in the Higashiyama area, Kyoto. Our objective is to obtain an understanding of the time an evacuation might require, as well as to understand where the capacity bottlenecks are. An emphasis of our project remains the impact of “intelligent information provision.” We suggest that especially tourists unfamiliar with the local infrastructure struggle to find their way out of a dangerous area quickly and might hence require additional information provided at very local scale and in a variety of languages.

To simulate evacuation scenarios, we will use pedestrian simulation software as well as analytical models. Furthermore, to understand information needed by tourists in case of evacuation, we will conduct experiments set in virtual reality where participants will indicate the route they would like to take and the information they are lacking to be ensured of their decision. Finally, we will conduct “treasure hunt” experiments simulating the need to find one’s way quickly. In these experiments we will test route guidance with the BLE (Bluetooth Low Energy) technology tested before in the data collection stage of this project.

3. 日本側研究チームの実施概要

The Higashiyama evacuation scenarios have been mostly completed as planned. We simulated a range of scenarios, in particular changing assumptions of route guidance. The results suggest that, compared to current guidelines, some changes to route guidance protocols might be considered to potentially reduce evacuation time and overcrowding.

We furthermore conducted parts of the planned experiments but could not complete the experiments that were planned to be carried out in Israel due to the COVID situation. The Kyoto experiments were slightly delayed but could be conducted in November 2020. In the first experiment, we used Virtual Reality glasses to test wayfinding strategies of participants in the Higashiyama area. We asked respondents to find ways to shelter locations by navigating from one junction to the next in a tailor-made app created by the Israeli team. In a second experiment, also in the Higashiyama area, we asked tourists to participate in an experiment where they needed to install an application on their mobile phone. This app provided tourists with information, including route guidance through pop-up messages that are triggered by sensors installed by us. Taken together, the results demonstrate the usefulness and limitations of mobile phone notifications for route guidance in normal and emergency situations.