

Keynote: Situational Awareness Platform for City Transportation

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I. INTRODUCTION

Society5.0, indicated in the 5th Science and Technology Basic Plan in Japan, is aimed at bringing together technologies that information science has pursued, such as artificial intelligence, robots, IoT, and big data, and seeks to realize a society where individual people can enjoy the benefits. A cyber-physical system is indispensable for achieving that goal as it aggregates large amounts of data from the physical world, analyzes data in the cyber world, and feeds back to the real world. Among several promising application domains, the cyber-physical system is expected to contribute to the intelligent management and control of city transportation where mobility big-data, such as the distribution of people in urban environments and the movement of cars, is used in traffic flow control, optimization of public transport and EV charging stations, safe walking support, and evacuation instruction planning for disaster resistance. So far, huge platforms have collected location data from their GPS-enabled phones and vehicles. However, those data are exclusive and not sufficient for highly-precise, more context-dependent understanding of situations. By understanding such a high-level context of individual pedestrians and vehicles and overlooking the macroscopic situation in which those players are involved, we may be able to identify the “cause” of the events like traffic congestion, several minor incidents that eventually lead to serious accidents.

This talk introduces our approach to building a situational awareness platform for city transportation. We use sensor data from smartphones and video from drive recorders to collect data from the pedestrians and vehicle drivers and use simulations to build high-precision mobility data in cyberspace. Such data can be used for anomaly detection in transportation and safe mobility support. We also discuss data augmentation techniques in cyberspace to complement the overwhelmingly lacking of the data from the physical world when taking crowdsourcing approaches.

II. SPEAKER BIOGRAPHY

Hirozumi Yamaguchi received the B.E., M.E., and Ph.D. degrees in information and computer science from Osaka University, Japan. He is currently an Associate Professor at Osaka University. He has been working in mobile and pervasive computing and networking research areas and has

published papers in IEEE and ACM premier conferences and top-quality journals. He has served on several conferences such as PerCom, ICNP, ICDCS, EAI Mobiquitous as organizing committee members and many conferences as technical committee members. He received Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology in 2018.

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