Data Synchronization Method in DTN Sensor Network Using Autonomous Air Vehicle

Thi Ha Phuong TRAN, Hiroshi YAMAMOTO, Katsuyuki YAMAZAKI

Nagaoka University of Technology, 1603-1 Kamitomioka, Nagaoka, Niigata 940-2188 Japan

phuongtran@stn.nagaokaut.ac.jp

Abstract—While sensor network system for monitoring wild animals or observing environment changes becomes more important, collecting those observation data becomes a problem. It is because the observation field is too wide, and is usually in a forest or on a mountain. Therefore, we are studying sensor network system based on Delay Tolerant Network (DTN) using autonomous air vehicle as a data ferry. In this paper, a method of synchronizing data between the multiple sensor nodes and the server using MySQL Replication has been proposed. In the proposed system, the air vehicle does not need to carry MySQL Database, instead should carry only updated information. We have performed experiments to evaluate the practicality of the proposed system. From the evaluation result, it has been clarified that the data synchronization can be completed by our proposed system, but the time for transferring data should be decreased to prevent waste time of flying.

Keyword—Delay Tolerant Network, Autonomous Air Vehicle, AR.Drone, MySQL Replication, Sensor Network

Thi Ha Phuong Tran received B.E. degree from Nagaoka University of Technology in '12. She is currently a graduate school student in Nagaoka University of Technology. Her research interests include sensor networks and Delay Tolerant Network.

Hiroshi Yamamoto received M.E. and D.E. degrees from Kyushu Institute of Technology, Iizuka, Japan in '03 and '06, respectively. From April '06 to March '10, he worked at FUJITSU LABORATORIES LTD., Kawasaki, Japan. Since April '10, he has been an Assistant Professor in the Department of Electrical Engineering, Nagaoka University of Technology. His research interests include computer networks, distributed applications, and networked services. He is a member of the IEEE.

Katsuyuki Yamazaki received B.E. and D.E degrees from the University of Electro-communications and Kyushu Institute of Technology in '80 and '01, respectively. At KDD Co. Ltd., he had been engaged in R&D and international standardization of ISDN, S.S. No.7, ATM networks, L2 networks, IP networks, mobile and ubiquitous networks, etc., and was responsible for R&D strategy of KDDI R&D Labs. He is currently a Professor of Nagaoka University of Technology.