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Title: Prediction, Optimization, and Control Technology: Techniques, Applications and Challenges

Abstract

IoT based applications are getting popular in everyday life. These applications make use of many underlying enabling technologies such as communication, electronic, information processing and artificial intelligence (AI) algorithms, etc. Remarkable development in IoT related technologies in recent past along with advancement in smart solutions has paved the way for transforming conventional cities into smart cities. In most of the IoT-based solutions, AI algorithms are mainly used for prediction, classification, optimization, control applications. Growing demands for smart solutions are putting increasing pressure on experts and system designers to seek efficient and economical way of resources utilization. Development of advanced optimization algorithms has attracted many researchers to seek solutions for complex real-world problems. However, most of the studies are focused on individual key component (i.e., prediction, optimization, control) or in combination of two. Usually, many systems are based on a selected AI algorithm which is once trained and then used (locked). This talk will present an integrated solution based on three distinct algorithms i.e. (prediction, optimization, and control). Further, the performance of these modules can be enhanced using learning module to support autonomous environment monitoring and control. Some use-case applications scenarios will be presented to highlight the effectiveness of this novel integrated solution.

Profile

Israr Ullah is currently working as research associate in IoT at School of Computing, Ulster University, UK. He is the research lead of the “Information SLA for IoT Echo Systems” project team and conducting research on novel machine learning solutions for IoT systems that are relevant to service level agreement and end-to-end communication in collaboration with other Ulster University and British Telecom (BT) members of the team. Earlier, he has completed PhD in Computer Engineering from Jeju National University, South Korea in February 2019. He has published more than 50 peer-reviewed research articles in reputed journals. His research is mainly focused on development of AI based IoT solutions for smart cities. His research interests also include designing and analysis of optimization algorithms using AI techniques.