MULTI-AGENT REINFORCEMENT LEARNING FOR TOURISM SERVICE RECOMMENDATION SYSTEM IN SMART CITIES DESTINATION

Pannee SUANPANG[1] and Pitchaya JAMJUNTR[2]
      [1] Suan Dusit University, THAILAND
      [2] University of Technology Thonburi, THAILAND
      Pannee_sua@dusit.ac.th (P._S.) (Corresponding author)

ABSTRACT

The tourism industry is continuously evolving, with travelers seeking personalized and tailored experiences in smart cities destination. To address this challenge this study introduces a novel approach to tourism service recommendation systems by using Multi-Agent Reinforcement Learning (MARL) is a promising approach enables agents to collaborate and compete in complex environments. This paper proposes a MARL-based method for tourism service recommendation which learns from customer feedback to generate personalized recommendations. The proposed method employs a centralized critic and decentralized actor architecture to capture the complex interactions between agents and generate high-quality recommendations. The method's perfor-mance is evaluated on a real-world dataset and the results demonstrate that it outperforms ex-isting methods in terms of recommendation accuracy and diversity. Additionally, this paper presents a tourism service recommendation system based on MARL and evaluates it using five algorithms: Real, Random, DQN, DDPG, and MADDPG. The results indicate that the MADDPG algorithm outperforms the other algorithms in terms of MCWT, CFT, and TSF. Finally, the im-plications of this study to tourism industry and can contribute to the development of more advanced and efficient tourism service intelligent recommendation systems.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.