Relocation Framework to Improve the Usage Efficiency of Bicycle-sharing Systems

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***Abstract*— Recently, a bicycle-sharing system has been greatly spotlighted as a second transportation vehicle. However, since shared bicycles are used for tons of users, the bicycles should be relocated accordingly. To handle the bicycle relocation problem, relocation managers move bicycles from one station to another station by using their own experiences. Relocating bicycles by the mangers' experiences might be ineffective and inconsistent.**

In this paper, we propose an effective and systematic relocation framework which consists of the demand forecasting step and the relocation step. In the demand forecasting step, we try to precisely forecast the bicycle demand by utilizing multiple machine learning techniques. In the relocation step, we provide an algorithm to optimize the relocation process. We are expecting that the relocation process will be greatly improved if our relation framework is used in the real bicycle-sharing system.

***Keyword*— Bicycle-sharing System, Demand Forecasting, Bicycle Relocation, Regression, LSTM**

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