A Simulation Study on the Design and Management Strategies to Public Bike Sharing Systems

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With the contributions on reducing the traffic congestion and air pollution, bike sharing systems become more popular recently in many metropolitan areas worldwide. Without effective bike redistribution strategies, a bike rental station may easily become out or full of bikes, which incurs the customer inconvenience and conflicts its purpose. In order to evaluate the impacts and performance on different bike redistribution strategies, we propose and simulate several bike redistribution strategies with and without different levels of real-time or historical bike rental information. Our simulation results indicate good use of the rental information does boost up the system service level. Finally we illustrate how our simulation system can be used for advanced investigation on several challenging problems related with bike sharing systems.

***Keywords*:** Bike sharing Systems, Simulation, Bike redistribution, Rental information, Service level

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