**FooDNet: Toward an Optimized Food Delivery Network based on Spatial Crowdsourcing**

**Abstract:**

This paper builds a Food Delivery Network (FooDNet in short) using spatial crowdsourcing (SC). It investigates the participation of urban taxis to support on demand take-out food delivery. Unlike existing SC-enabled service sharing systems (e.g., ridesharing), the delivery of food in FooDNet is more time-sensitive and the optimization problem is more complex regarding high-efficiency, huge-number of delivery needs. In particular, two on demand food delivery problems under different situations are studied in our work: (1) for O-OTOD, the food is opportunistically delivered by taxis when carrying passengers, and the optimization goal is to minimize the number of selected taxis to maintain a relatively high incentive to the participated drivers; (2) for D-OTOD, taxis dedicatedly deliver food without taking passengers, and the aim is to minimize the number of selected taxis (i.e., to raise the reward for each participant) and the total traveling distance to reduce the cost. A two-stage approach, including the construction algorithm and the Adaptive Large Neighborhood Search (ALNS) algorithm based on simulated annealing, is proposed to solve the problem. We have conducted extensive experiments based on the real-world datasets, including city-wide restaurant data, cell tower data, and the large-scale taxi trajectory data with 10,000 taxis in the city of Chengdu, China. Experimental results demonstrate that our proposed algorithms are more effective and efficient than baselines, fulfilling the food delivery service using a smaller number of taxis within the given time

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

* System : Pentium Dual Core.
* Hard Disk : 120 GB.
* Monitor : 15’’ LED
* Input Devices : Keyboard, Mouse
* Ram : 1 GB

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows XP/UBUNTU.
* Implementation : NS2
* NS2 Version : 2.28
* Front End : OTCL (Object Oriented Tool Command  Language)
* Tool : Cygwin (To simulate in Windows OS)