



Dr. Parimal Parag

Associate Professor
Electrical Communication Engineering
Indian Institute of Science, Bangalore

The Power of Two in Large Service-Marketplaces

Tuesday – February 25, 2025 | 3:00pm | GRIS – Room 103

ABSTRACT

We consider a large-scale service marketplace with numerous servers that scale with the job arrival rate. Jobs arrive with private valuations representing their willingness to pay. In a centralized system, jobs are matched to available servers, and prices are set in a centralized manner to maximize revenue. We investigate whether similar scalability can be achieved in a distributed marketplace where jobs are randomly matched to servers, which set their own prices based on job valuations and system occupancy. We then examine matching jobs to two servers, which compete to provide service if unoccupied. We demonstrate the existence and convergence to a mean field equilibrium (MFE) in this setup, where servers strategically respond to competitors' prices.

BIO

Parimal Parag is currently an associate professor in department of electrical communication engineering at Indian Institute of Science at Bangalore. He was working as senior systems engineer in R&D at ASSIA Inc. from October 2011 to November 2014. He received his B. Tech. and M. Tech. degrees from Indian Institute of Technology Madras in fall 2004; and the PhD degree from Texas A&M University in fall 2011. He was at Stanford University and Los Alamos National Laboratory, in autumn of 2010 and summer of 2007, respectively.

His research interests are in design, performance evaluation, and control of large distributed and networked intelligent systems applying mathematical tools from queueing theory, information theory, coding theory, and optimization methods. His previous work includes performance evaluation, monitoring, and control of large broadband communication systems and networks. His other research interests lie in the areas of applied probability, game theory, statistical signal processing, estimation & detection theory, and combinatorics.