Ragavendran (Raga) Gopalakrishnan

https://smith.queensu.ca/faculty_and_research/faculty_list/gopalakrishnan-raga.php

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RESEARCH INTERESTS

- **Service Operations Management**: Service systems with strategic entities (customers/servers).
- **Pricing & Revenue Management**: Sustainable market models for modern urban mobility.

My research combines tools from multiple subjects such as optimization, probability, queueing theory, decision theory, game theory and mechanism design for obtaining analytical results, as well as numerical methods and data-driven simulation for validation in real-world environments.

CURRENT POSITION

Queen's University, Kingston, ON, Canada. **July 2019 - Present**
Assistant Professor of Operations Management, Stephen J.R. Smith School of Business.
Area Group: *Management Analytics.*

PRIOR POSITIONS

Cornell University, Ithaca, NY. **December 2017 - June 2019**
Postdoctoral Associate, School of Civil & Environmental Engineering.
Visiting Postdoctoral Associate, School of Operations Research & Information Engineering.
Hosted by Samitha Samaranayake and Siddhartha Banerjee.

Conduent Labs India (formerly Xerox Research Centre India), Bangalore, India.
Algorithms & Optimization Area, Data Analytics Lab.
Research Manager **January 2017 - September 2017**
Research Scientist **April 2015 - December 2016**

University of Colorado Boulder, Boulder, CO. **July 2013 - February 2015**
Research Associate, Department of Electrical, Computer & Energy Engineering.
Hosted by Jason Marden.

University of Southern California, Los Angeles, CA. **August 2013 - February 2015**
Visiting Researcher, Department of Data Sciences & Operations, Marshall School of Business.
Hosted by Amy Ward.

EDUCATION

California Institute of Technology, Pasadena, CA. **September 2008 - June 2013**
Ph.D. in Computer Science, June 2013.
M.S. in Computer Science, June 2010.
Department of Computing + Mathematical Sciences.
Dissertation: Characterizing Distribution Rules for Cost Sharing Games. Defense: Video
Advisor: Adam Wierman.

Indian Institute of Technology Madras, Chennai, India. **July 2004 - July 2008**
B.Tech. in Computer Science and Engineering, July 2008.

TEACHING EXPERIENCE & DEVELOPMENT

Inclusive Teaching Institute. Workshop Attendee, Cornell. **April 13-14, 2018**
CEE 6620, Transportation System Design & Analysis. Guest Lecturer, Cornell. **Spring 2018**
ECEN 5018, Game Theory & Multiagent Systems. Guest Lecturer, CU-Boulder. **Spring 2014**
ECEN 2703, Discrete Mathematics. Guest Lecturer, CU-Boulder. **Fall 2013**
CS/EE 144, Ideas Behind the Web. Teaching Assistant, Caltech. **Winters 2011, 2012**
CS/EE 147, Network Performance Evaluation. Teaching Assistant, Caltech. **Spring 2010**

JOURNAL PUBLICATIONS

Gopalakrishnan R, Doroudi S, Ward AR, Wierman A (2016) *Routing and Staffing when Servers are Strategic.* ***Operations Research***, 64(4):1033–1050.[1]

Gopalakrishnan R, Marden JR, Wierman A (2014) *Potential Games are Necessary to Ensure Pure Nash Equilibria in Cost Sharing Games.* ***Mathematics of Operations Research***, 39(4):1252–1296.[1]

[1] Earlier versions were accepted to the ACM Conference on Economics and Computation (EC) 2014/2013, appearing as extended abstracts.

Doroudi S, Gopalakrishnan R, Wierman A (2012) *Dispatching to Incentivize Fast Service in Multi-Server Queues.* ***Performance Evaluation Review***, 39(3):43–45.

Gopalakrishnan R, Marden JR, Wierman A (2011) *An architectural view of game theoretic control.* ***Performance Evaluation Review***, 38(3):31–36.

WORKING PAPERS

Gopalakrishnan R (2018) *On the Architecture of Service Systems when Servers are Strategic.*

Gopalakrishnan R, Tulabandhula T, Mukherjee K (2018) *Sequential Individual Rationality in Dynamic Ridesharing.*

Gopalakrishnan R, Hssaine C, Banerjee S, Samaranayake S (2018) *Economic Challenges in Designing a Sustainable Urban Mobility Marketplace.*

REFEREED CONFERENCE PROCEEDINGS

Biswas A, Gopalakrishnan R, Tulabandhula T, Mukherjee K, Metrewar A, Thangaraj RS (2018) *Impact of Detour-Aware Policies on Maximizing Profit in Ridesharing.* ***International Workshop on Agents in Traffic and Transportation (ATT)***.

Biswas A, Gopalakrishnan R, Tulabandhula T, Mukherjee K, Metrewar A, Thangaraj RS (2017) *Profit Optimization in Commercial Ridesharing.* ***International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS)***.

Gopalakrishnan R, Biswas A, Lightwala A, Vasudevan S, Dutta P, Tripathi A (2016) *Demand Prediction and Placement Optimization for Electric Vehicle Charging Stations.* ***International Joint Conference on Artificial Intelligence (IJCAI)***.

Biswas A, Gopalakrishnan R, Dutta P (2016) *Managing Overstaying Electric Vehicles in Park-and-Charge Facilities.* ***International Joint Conference on Artificial Intelligence (IJCAI)***.

Marden JR, Touri B, Gopalakrishnan R, O'Brien JP (2015) *Impact of Information in a Simple Multiagent Collaborative Task.* ***IEEE Conference on Decision and Control (CDC)***.

Gopalakrishnan R, Nixon SD, Marden JR (2014) *Stable Utility Design for Distributed Resource Allocation.* ***IEEE Conference on Decision and Control (CDC)***.

Gopalakrishnan R, Kanoulas D, Karuturi NN, Rangan CP, Rajaraman R, Sundaram R (2012) *Cache Me If You Can: Capacitated Selfish Replication Games.* ***Latin American Theoretical INformatics Symposium (LATIN)***.

Gopalakrishnan R, Marden JR, Wierman A (2011) *Characterizing Distribution Rules for Cost Sharing Games.* ***International Conference on NETwork Games, COntrol and OPtimization (NETGCOOP)***.

Selvi SSD, Vivek SS, Gopalakrishnan R, Karuturi NN, Rangan CP (2009) *On the Provable Security of Multi-Receiver Signcryption Schemes.* ***International Conference on Information Security and Cryptology (ICISC)***.

Selvi SSD, Vivek SS, Karuturi NN, Gopalakrishnan R, Rangan CP (2008) *Cryptanalysis of Bohio et al.'s ID-Based Broadcast Signcryption (IBBSC) Scheme for Wireless Ad-hoc Networks.* ***International Conference on Privacy, Security and Trust (PST)***.

Selvi SSD, Vivek SS, Gopalakrishnan R, Karuturi NN, Rangan CP (2008) *Cryptanalysis of Mu et al.'s and Li et al.'s Schemes and a Provably Secure ID-Based Broadcast Signcryption (IBBSC) Scheme.* ***International Workshop on Information Security Applications (WISA)***.

PATENTS FILED

Gopalakrishnan R, Biswas A, Metrewar A, Mukherjee K, Thangaraj RS (2016) *Method and System for Real Time Ridesharing Management.* ***U.S. Patent Application No. 15373744***.

Gopalakrishnan R, Biswas A, Lightwala A, Tripathi A, Dutta P, Greene DH (2016) *Method of Planning for Deployment of Facilities and Apparatus Associated Therewith.* ***U.S. Patent Application No. 15205206***.

Gopalakrishnan R, Biswas A, Dutta P, Tripathi A (2016) *Method and System for Managing Parking Violations by Vehicles in Parking Areas in Real-Time.* ***U.S. Patent Application No. 15194730***.

Gopalakrishnan R, Mukherjee K, Thangaraj RS, Rai A (2016) *Method and System for Cost Sharing in a Pooled Vehicle.* ***U.S. Patent Application No. 15183827***.

PROFESSIONAL ACTIVITIES

Co-Organizer: Xerox Research Centre India (XRCI) - Indian Institute of Technology Guwahati (IITG) Workshop on Game Theory, Optimization & Machine Learning, November 7-8, 2015.

Journal Referee: Operations Research, Management Science, Production and Operations Management, ACM Transactions on Internet Technology, IEEE Transactions on Mobile Computing.

Conference Referee: ACM SIGMETRICS, ACM EC, IEEE CDC.

Member: INFORMS (APS, MSOM, TSL, MIF), ACM, IEEE.

INTERNSHIPS

Google, Boulder, CO. **Summer 2011**
Software Engineering Intern, Native Client SDK Team.

Yahoo!, Burbank, CA. **Summer 2009**
Research Intern, Marketplace Design.

Northeastern University, Boston, MA. **Summer 2007**
Research Intern, College of Computer & Information Science.

CONFERENCE & INVITED TALKS

Economic Challenges in Designing a Sustainable Urban Mobility Marketplace

- INFORMS Annual Meeting, Phoenix, AZ, November 2018.

On the Design of Service Systems when Servers are Strategic

- Rotman School of Management, University of Toronto, ON, November 2018.
- INFORMS Annual Meeting, Phoenix, AZ, November 2018.
- Simon Business School, University of Rochester, NY, October 2018.
- MSOM Conference, Dallas, TX, July 2018.

Sequential Individual Rationality in Dynamic Ridesharing

- INFORMS Annual Meeting, Houston, TX, October 2017.
- TSL Conference, Chicago, IL, July 2017.
- MSOM Service Operations SIG Conference, Chapel Hill, NC, June 2017.
- INFORMS Annual Meeting, Nashville, TN, November 2016.
- Marshall School of Business, University of Southern California, Los Angeles, CA, April 2016.
- Indian Institute of Science, Bangalore, India, February 2016.

Routing and Staffing Games in Service Systems

- MSOM Service Operations SIG Conference, Seattle, WA, June 2014.
- Young European Queueing Theorists (YEQT) Workshop, Eindhoven, Netherlands, November 2013.
- INFORMS Annual Meeting, Minneapolis, MN, October 2013.
- INFORMS Applied Probability Society Conference, San Jose, Costa Rica, July 2013.
- INFORMS Applied Probability Society Conference, Stockholm, Sweden, July 2011.

Characterizing Distribution Rules for Cost Sharing Games

- International Conclave on Foundations of Decision and Game Theory, Mumbai, India, March 2016.
- Marshall School of Business, University of Southern California, October 2013.
- Stony Brook Conference on Game Theory and Applications, Stony Brook, New York, July 2013.

HONORS

Scientific Excellence Award, Xerox/Conduent Labs India. **2017**

On-The-Spot Award for *Go Bengaluru*, a multi-modal trip planning app for the city of Bangalore, Xerox/Conduent Labs India. **2016**

Special Division Fellowship, Caltech. **2008**

INSTITUTE SERVICE

Member of the Graduate Honor Council, Caltech. **2009 - 2013**

Councillor in the Guidance and Counselling Unit, IIT Madras. **2007 - 2008**

Member of the Class Committee, IIT Madras. **2006 - 2008**

Volunteer in the National Service Scheme, IIT Madras. **2004 - 2006**