# Manu K. Gupta

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**OBJECTIVE** To develop and improvise optimal control algorithms for complex random systems

**EDUCATION**

***Bachelor of Science***
Lucknow Christian Degree College, Lucknow
Graduated July 2009 (Grade 71%)
Concentration: Statistics, Mathematics and Computer Applications (SMCA)

***Master of Science + Doctor of Philosophy Dual Degree***
Indian Institute of Technology, Bombay
Currently Pursuing (Joined July 2009)
Department: Industrial Engineering and Operations Research
Concentration: Optimization of stochastic systems (CGPA: 8.66/10)

**COMPUTER SKILLS**

*Languages & Software:* C, ARENA, Easy-Fit, CPLEX, R, Matlab, LaTeX, AnyLogic
*Operating Systems:* GNU/Linux, Windows

**MAJOR COURSES**

Optimization Techniques, Introduction to Stochastic Models, Integer Programming, Markov Decision Process, Selected Applications of Stochastic Systems, Analysis and Control of Queues, Discrete Event Simulation, Engineering Statistics, Computer Programming and Algorithms, Modelling and Computational lab, IEOR lab.

**RESEARCH PUBLICATIONS**

1. Manu K. Gupta, N. Hemachandra, and J. Venkateswaran, *Optimal pricing and preemptive scheduling in exponential server with two classes of customers*, International Conference on Optimization, Computing and Business Analytics , Kolkata, India, Allied Publishers, pp. 103-108, 12/2012.
2. Ratnaji Vanga, Manu K. Gupta, and J. Venkateswaran, *Performance Evaluation of Bat Algorithm to Solve Deterministic and Stochastic Optimization Problems*, International Simulation Conference of India, IIT Madras, Chennai, 02/2013
3. Veeraruna Kavitha, Veronique Capdevielle, and Manu K. Gupta, *Small Cell Networks: Speed Based Power Allocation*, 51st Annual Allerton Conference on Communication, Control, and Computing , University of Illinois at Urbana-Champaign, Allerton Retreat Center, Monticello, Illinois, 10/2013
4. A. Rawal, Veeraruna Kavitha and Manu K. Gupta, *Optimal Surplus Capacity Utilization in Polling Systems via Fluid Models*, 12th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt) , Hammamet, Tunisia, 05/2014
5. Manu K. Gupta, N. Hemachandra and J. Venkateswaran. *On completeness and equivalence of EDD and HOL-PJ dynamic priority schemes in two class $M/G/1$ queue* Submitted in CDC-2014.
6. Manu K. Gupta, N. Hemachandra, Bharat S. Raghav and J. Venkateswaran. *On a conjecture and performance of a two class delay dependent priority queue arising from pricing surplus server capacity* Submitted in EJOR.
7. Manu K. Gupta, *Pricing Server's Surplus Capacity*, Presented in IEOR day, IIT Bombay

**MAJOR PROJECTS**

1. Karnataka Engineering Company (KEC) (Autumn 2009)
   - Modeled an integer linear program formulation to decide optimal stockyard locations.
   - Coded the model in OPL/CPLEX Suggested optimal locations for stockyards.
2. Simulator for analysis of queue in Rawai railway station (Autumn 2010)
   - Collected data to determine Inter arrival and service time distribution for different class of customers.
   - Used Easy-Fit 5.4 Professional to find the best fit parameter.

- Modelled the system using ARENA Simulation Software.
- Proposed recommendation based on optimal parameter setting.

3. Stochastic dynamic programming approach for airline ticketing (Autumn 2011)
   - Formulated a Markov Decision Process (MDP) model and used backward induction.
   - Used MATLAB for computational purpose.
4. Optimal routing for Mid-day meal vehicle (Autumn 2011)
   - Modelled as mixed integer program.
   - Solved using OPL/CPLEX to find optimal route.

**TEACHING EXPERIENCE**

*as a Teaching Assistant*
Indian Institute of Technology Bombay, Mumbai

- Modelling and Computational Lab (Autumn 2011)
- IEOR Lab (Spring 2012)
- Selected Applications of Stochastic processes (Autumn 2012)
- Analysis and Control of Queues (Spring 2013)
- Introduction to Stochastic Models (Autumn 2013)
- Analysis and Control of Queues (Spring 2014: Current TA)

Organised workshop for SAS and LaTeX. Conducted *tutorials* for Introduction to Stochastic Models in Autumn 2013.

**SCHOLASTIC ACHIVEMENT**

- Silver Medal in undergrads (06-09)
- AIR 82 in JAM exam conducted by IITs in 2009.

**SEMINARS**

- Attended International Simulation Conference of India (ISCI) in Feb 2012 at IIT Bombay.
- Attended winter school on Analytics & Optimization organised by IBM Research India, in October 2012 at Banglore.
- Attended International Conference on Optimization, Computing and Business Analytics (ICOCBA) in Dec 2012 at Kolkata
- Attended Operations Management Conclave at SP Jain Institute of Management Studies and Research, Mumbai in Jan 2013.
- Attended School on Stochastic Processes in Engineering organised by IISc Mathematics Initiative (IMI) in March 2013.
- Attended Workshop on High Dimensional Network Analytics organised at IISc in December 2013.

**POSITION OF RESPONSIBILITY**

- Research Scholar Companion (2011 - 2012)
- Library Secretary for Hostel 12 (2012 - 2013)
- Web Secretary for Hostel 12 (2013 - 2014)
- Election Officer for Departmental Council Election 2014