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## Doctor of Philosophy in Industrial Engineering & Operations Research



“Our doctoral program allows students to focus their research on making ground-breaking connections. The department provides a nurturing, collegial environment in which students thrive and grow to become the next leaders.”

**Dr. Jay Sethuraman**  
**Department Vice Chair**  
**Director of the PhD Program**

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Admissions Information Session  
Tuesdays, 3pm - 4pm

RSVP with [admit@ieor.columbia.edu](mailto:admit@ieor.columbia.edu)

**Application Deadline**  
**December 15 (Annually)**

[ieor.columbia.edu/doctoral](http://ieor.columbia.edu/doctoral)  
[ieor.columbia.edu/ieor-admissions](http://ieor.columbia.edu/ieor-admissions)

## PhD Curriculum

### *Select Course Highlights*

- Big Data
- Computing for Business Research
- Convex Optimization
- Data Driven Entrepreneurship
- Demand & Supply Analytics
- Financial Engineering
- Machine Learning
- Marketing Research
- Non Linear Programming
- Optimization
- Queueing Theory
- Scheduling Algorithms
- Stochastic Models
- Supply Chain Management



**Irene Lo**  
Ph.D. '18  
Stanford University  
Department of Management  
Science & Engineering  
Assistant Professor

Irene is joining the Department of Management Science & Engineering at Stanford University as an Assistant Professor. Her research interests include designing matching markets and assignment processes to improve market outcomes, with a focus on public sector applications and socially responsible operations research.



**Antoine Desir**  
Ph.D. '12  
INSEAD  
Technology and Operations  
Management  
Assistant Professor

Antoine is currently an Assistant Professor of Technology and Operations Management at INSEAD. He was previously a postdoctoral researcher at Google in the OMEGA team (Optimization, Markets, Graph mining via better Algorithms). His research area include revenue management, online advertising and choice modeling.

## Research Areas

- Algorithms
- Compressed Sensing
- Dynamic Pricing
- Dynamic Programming
- Financial Engineering
- Inventory Theory
- Market Design
- Markov Decision Processes
- Probability Models
- Queueing Theory
- Revenue Management
- Robust Optimization
- Service Systems
- Simulation
- Stochastic Processes
- Supply Chain