

# Mathieu Dahan

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## Employment

**2019 - Present** **Georgia Institute of Technology**, Atlanta, GA  
*Assistant Professor* in the H. Milton Stewart School of Industrial and Systems Engineering

## Education

**Massachusetts Institute of Technology (MIT)**, Cambridge, MA  
Ph.D. in Computational Science and Engineering, June 2019  
Thesis title: Strategic and Analytics-Driven Inspection Operations for Critical Infrastructure Resilience  
Committee: Saurabh Amin (advisor), Ali Jadbabaie, Patrick Jaillet (chair), Georgia Perakis  
M.S. in Computation for Design and Optimization, February 2016

**École Centrale Paris**, France  
M.Eng. in Applied Mathematics, December 2016  
B.Eng. in Applied Mathematics, September 2013

**Paris-Sud University**, France  
B.S. in Mathematics, November 2013

## Research Interest

Network and Combinatorial Optimization  
Computational Game Theory  
Data Analytics

Service Operations Management  
System Security and Interdiction  
Disaster Logistics

## Academic Publications

**Journal Articles** (published or submitted)

“Probability Distributions on Partially Ordered Sets and Network Security Games,” with Saurabh Amin and Patrick Jaillet. Major revision in *Mathematics of Operations Research*.

“Network Inspection for Detecting Strategic Attacks,” with Saurabh Amin and Lina Sela. Major revision in *Operations Research*.

“Leveraging sUAS for Infrastructure Network Exploration and Failure Isolation,” with Saurabh Amin, Andrew C. Lee, and Andrew J. Weinert. *Journal of Intelligent & Robotic Systems*, April 2018.

### Articles in Preparation

“Designing Network Inspection Operations Using Imperfect Diagnostic Information,” with Saurabh Amin, Steven B. Link, and Georgia Perakis. Targeted for *Management Science*.

“Uncertainty-Aware Routing of Aerial Sensors for Infrastructure Damage Inspection,” with Saurabh Amin, Cynthia Barnhart, Jeremy Justice, and Andrew C. Lee. Targeted for *Operations Research*.

### Refereed Conference Proceedings

“A Network Monitoring Game with Heterogeneous Component Criticality Levels,” with Saurabh Amin, Jezdimir Milošević, and Henrik Sandberg. *58th IEEE Conference on Decision and Control (CDC)*, Nice, France, December 2019.

“Integration of sUAS-Enabled Sensing for Leak Identification with Oil and Gas Pipeline Maintenance Crews,” with Saurabh Amin and Andrew C. Lee. *2017 International Conference on Unmanned Aircraft Systems*, Miami, FL, June 2017.

“Network Sensing for Security Against Link Disruption Attacks,” with Saurabh Amin and Lina Sela Perelman. *54th Allerton Conference on Communication, Control and Computing*, Urbana, IL, October 2016.

“Network Flow Routing under Strategic Link Disruptions,” with Saurabh Amin. *53rd Allerton Conference on Communication, Control and Computing*, Urbana, IL, October 2015.

### Honors and Awards

2018	Best Poster Award, Princeton Day of Optimization
2018	MIT Robert B. Guenassia Award
2017	Honorable Mention, Abdul Latif Jameel World Water and Food Security Lab Fellowships
2016	MIT Robert E. Thurber Fellowship

### Presentations

*Analytics-Driven Response Operations for Infrastructure Resilience*, presented at:  
POMS Annual Conference, Washington, DC, May 2019

*Strategic and Analytics-Driven Inspection Operations for Infrastructure Resilience*, presented at:  
College of Management of Technology Seminar, EPFL, Switzerland, February 2019  
Industrial and Systems Engineering Seminar, Georgia Tech, December 2018  
Operations Management Seminar, MIT Sloan School of Management, October 2018  
Princeton Day of Optimization, Princeton, NJ, September 2018 (**Best Poster Award**)

*Designing Network Inspection Operations Using Imperfect Diagnostic Information*, presented at:  
INFORMS Annual Meeting, Phoenix, AZ, November 2018  
MSOM Conference, Dallas, TX, July 2018  
INFORMS Annual Meeting, Houston, TX, October 2017

*Network Inspection for Detecting Strategic Attacks*, presented at:  
INFORMS Annual Meeting, Nashville, TN, November 2016  
Allerton Conference on Communication, Control and Computing, Urbana, IL, October 2016

*Network Flow Routing under Strategic Link Disruptions*, presented at:

INFORMS Annual Meeting, Philadelphia, PA, November 2015

Allerton Conference on Communication, Control and Computing, Urbana, IL, October 2015

## Research Experience

**2014 - 2019**      **Massachusetts Institute of Technology**, Cambridge, MA

*Graduate Research Assistant*

Advisor: Prof. Saurabh Amin

Designing inspection strategies for monitoring of large-scale systems facing random failures and security attacks. Scheduling response operations for disaster logistics using predictive analytics. Collaborations with the California Pacific Gas & Electricity Company, City of Houston's Flood Control Division, and MIT Lincoln Laboratory's Humanitarian Assistance and Disaster Relief Systems Group.

**Summer 2016**    **Amazon.com**, Seattle, WA

*Research Scientist Intern*

Supervisors: Dmitriy Belyi, Frantisek Rolinek, Jingchen Wu

Designed machine-learning algorithms to predict fulfillment costs. Developed a prototype to grant a fast and accurate access to future cost estimates.

**2012 - 2013**      **École Centrale Paris**, France

*Undergraduate Researcher*

Advisors: Veronique Letort, Olivier Saut

Developed simulation models for predicting the evolution of brain tumors and personalizing treatments.

## Teaching Experience

**Springs 2018**    **Massachusetts Institute of Technology**, Cambridge, MA

**and 2019**      *Teaching Assistant* for 15.053 - Optimization Methods in Business Analytics (Sloan undergraduate elective)

Instructor: Prof. James Orlin

Lead recitations, and assisted in helping students with homework and course project, designing and grading exams.

**Fall 2016**      **Massachusetts Institute of Technology**, Cambridge, MA

*Guest Lecturer* for 1.208 - Resilient Infrastructure Networks (PhD-level course in engineering)

Instructor: Prof. Saurabh Amin

Delivered guest lectures on network interdiction problems and routing games. Assisted in creating course content.

**Spring 2016**    **Massachusetts Institute of Technology**, Cambridge, MA

*Workshop* on "Security Games on Infrastructure Networks"

Instructors: L. Sela, M. Dahan, and J. Liu

Created an online attacker-defender game for MIT undergraduate students to discover applications of game theory for network sensing under strategic attacks.

Fall 2015

**Harvard University**, Cambridge, MA

*Workshop* on “Out of Water: Resilience of Urban Water Structures in the Wake of Disruptions”

Instructors: L. Sela, M. Dahan, J. Liu, and S. Amin

Presented to Harvard alumni the importance of game-theoretic models to design efficient monitoring operations in water networks facing strategic disruptions.

## Personal, Skills

Citizenship: France

Languages: French (native), English (fluent), Spanish (intermediate)

Computer Skills: Python, Julia, R, Matlab, SQL, LaTeX

Interests: Horseback riding (international show jumping competitions), piano

## References

### **Professor Saurabh Amin**

Associate Professor, *CEE, IDSS*  
Massachusetts Institute of Technology  
Cambridge, MA  
E-mail: [amins@mit.edu](mailto:amins@mit.edu)

### **Professor Patrick Jaillet**

Co-Director, *ORC*  
Massachusetts Institute of Technology  
Cambridge, MA  
E-mail: [jaillet@mit.edu](mailto:jaillet@mit.edu)

### **Professor Georgia Perakis**

Professor, *Sloan School of Management*  
Massachusetts Institute of Technology  
Cambridge, MA  
E-mail: [georgiap@mit.edu](mailto:georgiap@mit.edu)

### **Professor James Orlin**

Professor, *Sloan School of Management*  
Massachusetts Institute of Technology  
Cambridge, MA  
E-mail: [jorlin@mit.edu](mailto:jorlin@mit.edu)

### **Professor Pablo Parrilo**

Professor, *EECS*  
Massachusetts Institute of Technology  
Cambridge, MA  
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August, 2019