

# SEBASTIEN MARTIN

(APR 2018)

Operations Research Center,  
Massachusetts Institute of Technology,  
77 Massachusetts Avenue, E40-130  
Cambridge MA 02139

Phone +1 (510)-229-2758  
Email [semartin@mit.edu](mailto:semartin@mit.edu)  
Website <http://www.mit.edu/~semartin>

## EDUCATION

---

- |                     |   |
|---------------------|---|
| <b>2014-Present</b> | <b>Massachusetts Institute of Technology</b> , Cambridge, MA.<br>PhD Candidate in Operations Research. Expected completion in June 2019. GPA: 5.0/5.0<br><b>Thesis Advisors: Profs. Dimitris Bertsimas and Patrick Jaillet.</b><br>Thesis: <i>The impact of scaling optimization.</i> |
| <b>2011-2014</b>    | <b>Ecole polytechnique</b> , Paris, France.<br>Master of Science in Applied Mathematics and Computer Science. GPA 4.23/4.4<br>Bachelor of Science in Pure Mathematics and Physics.  |

## RESEARCH INTERESTS

---

Large-Scale Optimization, Machine Learning, Transportation, Data Analytics, Public Policy.

## RESEARCH EXPERIENCE

---

- |                          |  |
|--------------------------|--|
| <b>2014-Present</b>      | <b>Massachusetts Institute of Technology</b> , Cambridge, MA.<br><i>Research Assistant.</i><br>Advisors: Profs Dimitris Bertsimas and Patrick Jaillet. |
| <b>2014</b><br>(Apr-Aug) | <b>University of California, Berkeley.</b> Institute of Transportation Studies.<br><i>Visiting Researcher.</i><br>Advisor: Prof. Alexandre Bayen.      |

## PUBLICATIONS

---

- |                        |   |
|------------------------|---|
| <b>Published</b>       | J. Reilly, S. Martin, M. Payer, A. Bayen (2016), Creating complex congestion patterns via multi-objective optimal freeway traffic control with application to cyber-security.<br><i>Transportation Research Part B</i> , 91, 366-382.           |
| <b>Completed Works</b> | D. Bertsimas, P. Jaillet, S. Martin (2017), Online Vehicle Routing: The Edge of Optimization in Large-Scale Applications. Accepted for publication, <i>Operations Research</i> .<br>- Best Presentation award, MIT LIDS 2018 Student Conference |

	D. Bertsimas, A. Delarue, P. Jaillet, S. Martin (2017), Travel Time Estimation in the Age of Big Data. Minor Revision, <i>Operations Research</i> .
Papers in Preparation	D. Bertsimas, A. Delarue, S. Martin, Changing Schools Start Times, <i>in preparation</i> .

## TEACHING EXPERIENCE

---

2018 (Apr)	<b>MIT Sloan School of Management</b> , Cambridge, MA. Invited Lecturer for on <i>The Analytics Edge – 15.071</i> I gave the lecture: <i>Driving Policy with Optimization</i> as a case study for prescriptive analytics
2018 (Feb)	<b>Sloan Sports Analytics Conference</b> , Boston. Workshop Speaker on <i>Optimization with JuMP and Julia</i> . – Rating 5/5
2017 (Fall)	<b>MIT Electrical Engineering and Computer Science</b> , Cambridge, MA. Teaching Assistant for <i>Introduction to Probability I/II – 6.041 A/B</i> . Enrollment 112 (Undergraduate and Graduate levels) – Rating 6.9/7
2016 (Spring)	<b>MIT Sloan School of Management</b> , Cambridge, MA. Teaching Assistant for <i>The Analytics Edge – 15.071</i> . Enrollment 172 (MBA Programs) – Rating 6.2/7.
2016, 2017 (Winter)	<b>MIT Operations Research Center</b> , Cambridge, MA. Instructor for <i>Computing in Optimization and Statistics</i> . I gave lectures about <i>Network Analytics in R</i> and <i>Optimization in Julia</i> .

## RESEARCH IMPACT & WORK EXPERIENCE

---

Spring 2017 - Present	<b>Boston Public Schools</b> , Boston, MA. I work with Boston Public Schools to design an algorithm to route their fleet of >800 school buses, together with D. Bertsimas and A. Delarue. We currently route 30,000 BPS students to their school for the 2017-2018 school year, <b>saving \$5M per year</b> in transportation costs, that will be re-invested in the classrooms. We are also working with them on <b>changing the bell times of 200 schools</b> to further optimize the bus routes, a project that combines the challenges of <i>Large-Scale Optimization</i> and <i>Public Policy</i> .
Summer 2016	<b>Google</b> , Mountain View, CA. <i>Software Engineering Intern</i> Successfully passed the Google Software Engineer coding interviews. Worked for Google Maps. Researched, experimented and implemented novel algorithms to improve maps and navigation data using large geolocation datasets (> 100Gb). Software tools: Java, MapReduce.

<b>2013</b>	<p><b>Startup SAM</b>, Paris, France  <i>Founder</i></p> <p>I designed and built a smart bicycle that automatically shifts gears, using machine learning to learn the behavior of experienced cyclists. I partnered with Decathlon, the European main sports gear retailer.</p>
<b>2011-2012</b>	<p><b>Firefighter Officer</b>, French Army  <i>Ecole polytechnique</i> (a military university) required me to do one year of military service, to learn about leadership and decision making. I served as the leader of a platoon of 30 military firefighters.</p>

## MEDIA COVERAGE

---

<b>2017</b>	<p><b>Routing Boston Public School Buses</b></p> <ul style="list-style-type: none"> <li>- <b>The Wall Street Journal</b>, <a href="#">How Do You Fix a School-Bus Problem? Call MIT</a>, Aug 11, 2017.</li> <li>- <b>Boston Globe</b>, <a href="#">Boston school bus performance improves dramatically</a>, Sept 08, 2017.</li> <li>- <b>Siam News</b>, <a href="#">A school-bus trip to the crossroads of policy and optimization</a>, Nov 21, 2017.</li> <li>- I also appeared on <a href="#">multiple websites, local TV and radio news channels</a>.</li> </ul>
-------------	---

## HONORS & AWARDS

---

<b>2018</b>	<p><b>Winning team in the “Future of Work” track, MIT Policy Hackathon</b></p> <p>The Jury of the MIT Policy hackathon selected our project: <i>Shared Responsibility: Social Forces in Response to Market Failures</i> to be the winner of the “Future of Work” track and finalist of the hackathon.</p>
<b>2018</b>	<p><b>Best Presentation, MIT LIDS Student Conference</b></p> <p>All participants of the conference voted for the best presentation, out of 22 PhD student presentations. The presentation of my paper <i>Online Vehicle Routing: The Edge of Optimization in Large-Scale Applications</i> won the competition.</p>
<b>2017</b>	<p><b>Boston Public Schools Transportations Challenge Winner</b>, Phases 1 and 2.</p> <p>Winner of a \$30,000 contest to optimize school bus routes. This competition was the beginning of our partnership with Boston Public Schools.</p>
<b>2013</b>	<p><b>Zodiac Aerospace – Gerondeau Innovation Prize</b></p> <p>Won a €10,000 prize for most innovative start-up, using machine learning to build a smart bicycle that automatically shifts gears.</p>
<b>2012</b>	<p><b>French Medal of National Defense, Bronze level</b></p> <p>I received this French military honor for my cumulated time in external operations during my year of service as a military firefighter.</p>

## SKILLS AND ACTIVITIES

---

Languages	French (native), English (full pro. proficiency), Spanish (intermediate).
Skills	<p>I try to open-source a <a href="#">large fraction of my research code</a>.</p> <p>I use regularly <i>Julia</i>, <i>Java</i>, <i>Python</i>, <i>SQL</i>, <i>R</i> and <i>MapReduce</i>.</p> <p>Co-organizer of the <i>MIT ORC Spring Seminar Series</i> (2016 and 2017).</p> <p>Member of ORC REFS team (Resources for Easing Friction and Stress). Support students that face issues related to research, communication, and personal matters. Completed semester-long conflict management and mediation training.</p> <p>Received month-long training in first aid service.</p>
Extra-curricular	General aviation pilot, cycling, piano & classical music in general.

## CITIZENSHIP

---

France.

## REFERENCES

---

### Dimitris Bertsimas

MIT Sloan  
(617) 253-4223  
[dbertsim@mit.edu](mailto:dbertsim@mit.edu)

### Patrick Jaillet

MIT EECS  
(617) 452-3379  
[jaillet@mit.edu](mailto:jaillet@mit.edu)

### Alexandre Bayen

UC Berkeley EECS  
(510) 642-2468  
[bayen@berkeley.edu](mailto:bayen@berkeley.edu)

### John Hanlon

Boston Public Schools  
(617) 635-9643  
[jhanlon@bostonpublicschools.org](mailto:jhanlon@bostonpublicschools.org)

### Jack Reilly

Google Inc.  
(916) 768-1755  
[jackdreilly@google.com](mailto:jackdreilly@google.com)