

# SEBASTIEN MARTIN

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## EDUCATION

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| <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>Optimization in the Era of Big Data</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 Mathematics and Physics.   |

## RESEARCH INTERESTS

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

## RESEARCH EXPERIENCE

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| <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

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| <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><b><i>Transportation Research Part B</i></b> , 91, 366-382.  |
| <b>Completed Works</b> | D. Bertsimas, P. Jaillet, S. Martin, Online Vehicle Routing: The Edge of Optimization in Large-Scale Applications. <b>Accepted for publication, <i>Operations Research</i>.</b> <ul style="list-style-type: none"><li>Best Presentation Award, MIT LIDS 2018 Student Conference</li></ul> |

D. Bertsimas, A. Delarue, P. Jaillet, S. Martin, Travel Time Estimation in the Age of Big Data. **Accepted for publication, *Operations Research*.**

D. Bertsimas, A. Delarue, S. Martin, From School Buses to Start Times: Driving Policy With Optimization. **In revision (3<sup>rd</sup> round), *Proceedings of the National Academy of Science (PNAS)*.**

- 2019 Franz Edelman Award Finalist
- 2018 Best Student Paper Award, MIT Operations Research Center
- 2<sup>nd</sup> place, *Doing Good With Good OR* competition (INFORMS 2018)

## TEACHING EXPERIENCE

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<b>2018</b> (Apr)	<b>MIT Sloan School of Management</b> , Cambridge, MA. Guest Lecturer for on <i>The Analytics Edge – 15.071</i> I gave the lecture: <i>Driving Policy with Optimization</i> , using my research as an example of prescriptive analytics for MBA students.
<b>2018</b> (Feb)	<b>Sloan Sports Analytics Conference</b> , Boston. Workshop Organizer: <i>Optimization with JuMP and Julia</i> . – Rating 5/5
<b>2017</b> (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
<b>2016</b> (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.
<b>2016, 2017</b> (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

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<b>Spring 2017 - Present</b>	<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> .
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Summer 2016	<p><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 (&gt; 100Gb).          Software tools: Java, MapReduce.</p>
2013	<p><b>Startup SAM</b>, Paris, France  <i>Founder</i>          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>
2011-2012	<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

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2018	<p><b>School start time choice in Boston</b></p> <ul style="list-style-type: none"> <li>- <b>The Boston Globe</b>, <a href="#">The Equity Machine</a>, Sept 20, 2018.</li> <li>- <b>Wired</b>, <a href="#">What the Boston School Bus Schedule Can Teach Us About AI</a>, Nov. 5, 2018.</li> </ul>
2017	<p><b>Routing school buses in Boston</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>The 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>- also appeared on <a href="#">multiple websites, local TV and radio news channels</a>.</li> </ul>

## HONORS & AWARDS

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2019	<p><b>Finalist, Franz Edelman Award</b>          My research collaboration with Boston Public School, because of the impact of the work on the school district, was selected to be a finalist of this competition.</p>
2018	<p><b>2<sup>nd</sup> prize, Doing Good with Good OR paper competition</b>          My paper "From School Buses to Start Times: Driving Policy With Optimization" was awarded the second prize of this student paper competition at INFORMS.</p>

2018	<b>Best student paper, MIT Operations Research Center</b> My paper “From School Buses to Start Times: Driving Policy With Optimization” won the yearly ORC prize of the best student paper. The prize was attributed by a jury of OR and OM faculty.
2018	<b>Winning team in the “Future of Work” track, MIT Policy Hackathon</b> 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.
2018	<b>Best Presentation, MIT LIDS Student Conference</b> 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.
2017	<b>Boston Public Schools Transportation Challenge Winner, Phases 1 and 2.</b> Winner of a \$30,000 contest to optimize school bus routes. This competition was the beginning of our partnership with Boston Public Schools.
2013	<b>Zodiac Aerospace – Gerondeau Innovation Prize</b> Won a €10,000 prize for most innovative start-up, using machine learning to build a smart bicycle that automatically shifts gears.
2012	<b>French Medal of National Defense, Bronze level</b> I received this French military honor for my cumulated time in external operations during my year of service as a military firefighter.

## SKILLS AND ACTIVITIES

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Languages	French (native), English (fluent), 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, Java, Python, SQL, R and MapReduce</i>.</p> <p>Co-organizer of the <i>MIT ORC Spring Seminar Series</i> (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. I completed a semester-long conflict management and mediation training for this purpose.</p> <p>Received month-long training in first aid service.</p>
Extra-curricular	I am a general aviation pilot, long distance runner and pianist.

## CITIZENSHIP

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France.

## REFERENCES

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**Dimitris Bertsimas**

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