

SEBASTIEN MARTIN

(AUG 2018)

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EDUCATION

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

RESEARCH INTERESTS

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

RESEARCH EXPERIENCE

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

PUBLICATIONS

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

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. **Submitted to *PNAS*.**

- 2018 Best Student Paper Award, MIT Operations Research Center
- Finalist, *Doing Good With Good OR* competition (INFORMS 2018)

TEACHING EXPERIENCE

2018 (Apr)	MIT Sloan School of Management , 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.
2018 (Feb)	Sloan Sports Analytics Conference , Boston. Workshop Speaker on <i>Optimization with JuMP and Julia</i> . – Rating 5/5
2017 (Fall)	MIT Electrical Engineering and Computer Science , 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)	MIT Sloan School of Management , Cambridge, MA. Teaching Assistant for <i>The Analytics Edge – 15.071</i> . Enrollment 172 (MBA Programs) – Rating 6.2/7.
2016, 2017 (Winter)	MIT Operations Research Center , 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	Boston Public Schools , 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, saving \$5M per year in transportation costs, that will be re-invested in the classrooms. We are also working with them on changing the bell times of 200 schools 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	Google , 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.

2013

Startup SAM, Paris, France

Founder

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.

2011-2012

Firefighter Officer, French Army

Ecole polytechnique (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.

MEDIA COVERAGE

2017

Routing Boston Public School Buses

- **The Wall Street Journal**, [How Do You Fix a School-Bus Problem? Call MIT](#), Aug 11, 2017.
- **Boston Globe**, [Boston school bus performance improves dramatically](#), Sept 08, 2017.
- **SIAM News**, [A school-bus trip to the crossroads of policy and optimization](#), Nov 21, 2017.
- I also appeared on [multiple websites, local TV and radio news channels](#).

HONORS & AWARDS

2018

Best student paper, MIT Operations Research Center

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

Winning team in the "Future of Work" track, MIT Policy Hackathon

The Jury of the MIT Policy hackathon selected our project: *Shared Responsibility: Social Forces in Response to Market Failures* to be the winner of the "Future of Work" track and finalist of the hackathon.

2018

Best Presentation, MIT LIDS Student Conference

All participants of the conference voted for the best presentation, out of 22 PhD student presentations. The presentation of my paper *Online Vehicle Routing: The Edge of Optimization in Large-Scale Applications* won the competition.

2017	Boston Public Schools Transportations Challenge Winner , Phases 1 and 2. Winner of a \$30,000 contest to optimize school bus routes. This competition was the beginning of our partnership with Boston Public Schools.
2013	Zodiac Aerospace – Gerondeau Innovation Prize Won a €10,000 prize for most innovative start-up, using machine learning to build a smart bicycle that automatically shifts gears.
2012	French Medal of National Defense, Bronze level 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

Languages	French (native), English (full pro. proficiency), Spanish (intermediate).
Skills	<p>I try to open-source a large fraction of my research code.</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

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Patrick Jaillet

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John Hanlon

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