SEBASTIEN MARTIN

(MAR 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: *The impact of scaling optimization*.

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

2014-Present — **Massachusetts Institute of Technology**, Cambridge, MA.
Research Assistant.
Advisors: Profs Dimitris Bertsimas and Patrick Jaillet.

2014 *(Apr-Aug)* — **University of California, Berkeley**. Institute of Transportation Studies.
Visiting Researcher.
Advisor: Prof. Alexandre Bayen.

PUBLICATIONS

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. *Transportation Research Part B*, 91, 366-382.

Completed Works — D. Bertsimas, P. Jaillet, S. Martin (2017), Online Vehicle Routing: The Edge of Optimization in Large-Scale Applications. Accepted for publication, *Operations Research.*
- 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. Major Revision, *Operations Research.*

Papers in Preparation

D. Bertsimas, A. Delarue, S. Martin, Changing Schools Start Times, *in preparation.*

TEACHING EXPERIENCE

2018 *(Feb)*

Sloan Sports Analytics Conference, Boston.
Workshop Speaker on *Optimization with JuMP and Julia. – Rating 5/5*

2017 *(Fall)*

MIT Electrical Engineering and Computer Science, Cambridge, MA.
Teaching Assistant for *Introduction to Probability I/II – 6.041 A/B.*
Enrollment 112 (Undergraduate and Graduate levels) – Rating 6.9/7

2016 (*Spring*)

MIT Sloan School of Management, Cambridge, MA.
Teaching Assistant for *The Analytics Edge – 15.071.*
Enrollment 172 (MBA Programs) – Rating 6.2/7.

2016, 2017 (*Winter*)

MIT Operations Research Center, Cambridge, MA.
Instructor for *Computing in Optimization and Statistics.*
I gave lectures about *Network Analytics in R* and *Optimization in Julia*.

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 *Large-Scale Optimization* and *Public Policy.*

Summer 2016

Google, Mountain View, CA.
Software Engineering Intern
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 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

I try to open-source a large fraction of my research code.
I use regularly *Julia, Java, Python, SQL, R and MapReduce.*

Co-organizer of the *MIT ORC Spring Seminar Series* (2016 and 2017).

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.

Received month-long training in first aid service.

Extra-curricular

General aviation pilot, cycling enthusiast, piano player & classical music lover.

Citizenship

France.

References

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