

# Virgile Galle

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## Education

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

Candidate for PhD in Operations Research; expected completion, February 2018.

Relevant Courses: Robust, Integer and Combinatorial Programming and Machine Learning

**GPA:** 5.0/5.0

**Advisors:** Cynthia Barnhart and Patrick Jaillet

**École Centrale**, Paris, France

Bachelor and Master of Engineering, June 2012 and 2013. Major: Applied Mathematics and Statistics

**GPA:** 4.0/4.0

**Advisor:** Gilles Faÿ

**Lycée Louis-Le-Grand**, Paris, France

Sept. 2009 – July 2011

Intensive preparation in Math and Physics for the highly competitive national entrance exams to the leading French Grandes Écoles (engineering schools)

## Research Interests

Mathematical Modeling, Combinatorial Optimization, Queuing Theory, Machine Learning, Transportation, Logistics, Scheduling, Energy.

## Work Experience

**2013** **MIT, Operations Research Center**, Cambridge, MA

(to Present) *PhD Candidate*

Working on increasing efficiency in port operations in a research team including MIT Chancellor and ORC co-director. Proposed efficient and novel solutions to solve the Container Relocation and the Yard Crane Scheduling Problems using techniques such as mathematical programming, dynamic programming and stochastic optimization. Submitted 3 papers to top peer-review journals in OR; Presented at INFORMS 2014/2015/2017 and TSL 2017.

**2016** **Schlumberger Doll Research Center**, Cambridge, MA

(Summer) *Research Scientist*

Pointed out the potential improvement of long term rigs scheduling and fleet sizing. Modeled mathematically the problem and solved it using IP and tuned evolutionary algorithms. The proposed solution incorporates new constraints, halves the cases of customer dissatisfaction and increases up to 5% the field production value. Implemented a fully documented package in Julia, ready to be linked with the existing software.

- 2015**  
(Summer) **Amazon.com**, Seattle, WA  
*Operations Research Intern*  
Modeled a large scale supply-chain problem: The Inbound Network of Amazon.com. Applied classical OR techniques (e.g. column generation) to solve efficiently the IP formulation. Performed experiments on forecast and historical data and found a potential gain of 17% in cost and in VLT.
- 2014**  
(to 2015) **MIT, in coordination with Tampa Bay Rays and Boston Celtics**, Cambridge, MA  
*Consultant*  
Designed a scout scheduling algorithm for the Tampa Bay Rays baseball team to improve minor league scouting. Built a lineup optimization tool for the Boston Celtics basketball team providing real-time substitution recommendations.
- 2012**  
(Summer) **Thales Optronics**, Glasgow and Belfast, United Kingdom  
*Intern*  
Assembled advanced electronics systems in high tech factories for the defense industry. Learned how to work in a structured team, to follow processes and to identify their control and bottlenecks.

## Research Experience

- 2013**  
(to Present) **MIT, Operations Research Center**, Cambridge, MA  
*PhD Candidate*  
Advisors: Cynthia Barnhart and Prof. Patrick Jaillet  
Working on increasing efficiency in port operations in a research team including MIT Chancellor and ORC co-director. Proposed efficient and novel solutions to solve the Container Relocation and the Yard Crane Scheduling Problems using techniques such as mathematical programming, dynamic programming and stochastic optimization. Submitted 3 papers to top peer-review journals in OR; Presented at INFORMS 2014/2015/2017 and TSL 2017.
- 2012**  
(to 2013) **École Centrale Paris, Laboratory of Mathematics in Interaction with CS**, Paris, France  
*Assistant Researcher*  
Advisor: Gilles Faÿ  
Created new uniformity tests on the unit sphere and applied those to astro-physical phenomena. Presented a report including several efficient approaches based on Wilcoxon and Kolmogorov-Smirnov tests.

## Published Article

*"An average-case asymptotic analysis of the Container Relocation Problem*, with S. Borjjan, V. Manshadi, C. Barnhart and P. Jaillet, published in *Operations Research Letters*, 44 (6) (2016), <http://dx.doi.org/10.1016/j.orl.2016.08.006> (citation: 1)

## Completed Works

*"A new 0-1 formulation of the restricted container relocation problem based on a binary encoding of configurations"*, with C. Barnhart and P. Jaillet, major revision in *European Journal of Operational Research*, September 2017. <https://dspace.mit.edu/handle/1721.1/109978>

*"The Stochastic Container Relocation Problem"*, with S. Borjian, V. Manshadi, C. Barnhart and P. Jaillet, major revision in Transportation Science, August 2017. <http://arxiv.org/abs/1703.04769> (citation: 1)

## Working papers

*"The Yard Crane Scheduling Problem"*, working paper with C. Barnhart and P. Jaillet

*"Container Relocation Problem: Approximation, Asymptotic and Incomplete Information"*, with S. Borjian, V. Manshadi, C. Barnhart and P. Jaillet, last revised October, 2015  
<https://arxiv.org/abs/1505.04229>. (citation: 2)

*"Online Container Relocation Problem"*, with C. Barnhart and P. Jaillet, working paper, October, 2015. <http://www.mit.edu/~vgalle/files/NoInfo.pdf>

## Invited Talks

2017, Houston, INFORMS Annual Meeting  
2017, Chicago, TSL INFORMS First Triennial Conference  
2016, Seattle, Amazon Faculty Summit  
2015, Philadelphia, INFORMS Annual Meeting  
2014, San Francisco, INFORMS Annual Meeting

## Honors and Awards

2013	Jean Gaillard Memorial Fellowship Committee on General Scholarships of Harvard University Fellowship to study at the Massachusetts Institute of Technology
2013	ODGE Robert Guenassia Award Office of the Dean of Graduate Education, MIT Fellowship to study at the Massachusetts Institute of Technology

## Skills and Activities

*Language:* English (fluent), French (native), German (intermediate), Italian (beginner)  
*Programming:* Matlab (expert), Julia (expert), Python (proficient), R (proficient), C++ (course experience), Gurobi (proficient), Xpress (proficient), SQL (prior experience)  
*Software:* Photoshop, Première Pro and After Effect  
*Sports:* Competition of Tennis, Rugby and Soccer. Empire diploma in the two first  
*Music:* 8 years of piano and musical studies at the conservatory of Paris

## Ability to work

EU as citizen of France; USA with a F-1 student visa (OPT)