# Raphaël Pestourie

Personal Website | Google Scholar | GitHub | LinkedIn
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US permanent resident, French citizen (updated: 28th October 2020)

## EDUCATION

### HARVARD UNIVERSITY
PhD in Applied Mathematics
Secondary field in Computational
Science and Engineering (CSE),
Sep 2014 - Dec 2019 | Cambridge, MA
GPA CSE: 4.0

### HARVARD UNIVERSITY
AM in Statistics
Sep 2017 - Dec 2019 | Cambridge, MA
Current GPA: 3.84

### ECOLE CENTRALE PARIS
Engineering Diploma
Specialization in Physics
Sep 2010 - Oct 2013 |
Chatenay, FR & Singapore
GPA: 3.8
Master of Research in Physics
with Ecole Polytechnique (X)
Sep 2012 – Oct 2013 | Palaiseau, FR
GPA: 4.0

### ESSEC BUSINESS SCHOOL
MIM and MBA
Ranked 4 worldwide by FT
Sep 2007 - Jun 2014 |
Paris, FR & Singapore
BSc: 4th/357 | Dean's list | GPA: 4.0

## COURSEWORK

### HARVARD UNIVERSITY
Probability
Linear and Generalized Linear Models
Statistical Inference
Quantitative Finance
Sequential Decision Making
Parallel computing
Bayesian Data Analysis

### CENTRALE/X
Modeling and simulation
Quantum and statistical physics

## SKILLS

Proficient knowledge:
Julia • Python (numpy) • R • VBA •
Matlab • Linux
Languages
French (native) • English (fluent)
German (C1) • Russian • Chinese

## CURRENT POSITION

### POSTDOC @ MIT MATHEMATICS   Feb 2020 - Present | Cambridge, MA
- numerical PDEs × optimization: inverse design of large-area photonic devices
- numerical PDEs × AI: active learning of deep surrogate models for PDEs
- AI × Inverse design: end-to-end optimization

## SELECTED PEER-REVIEWED PUBLICATIONS

- R. Pestourie, C. Pérez-Arancibia, Z. Lin, W. Shin, F. Capasso, and S. G. Johnson,"Inverse design of large-area metasurfaces." Optics Express (2018)
- C. Pérez-Arancibia, R. Pestourie, and S. G. Johnson, "Sideways adiabaticity: beyond ray optics for slowly varying metasurfaces," Optics Express (2018)
- R. Pestourie, E. Bayati, S. Colburn, Z. Lin, S. G. Johnson, A. Majumdar, "Inverse designed metalenses with extended depth of focus," ACS Photonics 2020
- R. Pestourie, Y. Mroueh, T. V. Nguyen, P. Das, S. G. Johnson, "Active learning of deep surrogates for PDEs" npj Computational Materials 2020
- Z.Lin, C. Roques-Carmes, R. Pestourie et al.,"End-to-End Inverse Design for Inverse Scattering via Freeform Metastructures." *under review*

## OTHER RESEARCH & WORK EXPERIENCE

### HARVARD UNIVERSITY/MIT MATHEMATICS  |
PhD candidate in Applied Mathematics
Sep 2014 - Jan 2020 | Cambridge, MA
- Inverse design in nanophotonics with Prof Steven Johnson (Mathematics MIT): "Assume Your Neighbor is Your Equal: Inverse Design in Nanophotonics" co-advised by Prof Federico Capasso (Harvard JA Paulson SEAS)
- Focus on high efficiency programming for PDEs and optimization in Julia
- Teaching assistant at Harvard: STAT123 "Quantitative Finance" (S2019), AM205 "Advanced Scientific computing" (F2015)

### FORTSTONE RESEARCH  | Quantitative researcher (Hedge fund)
July 2019 - Aug 2019 | Boston, MA
- Full cycle of strategy creation on commodity term curves

### UC BERKELEY PROF XIANG ZHANG'S LAB  | Visiting Scholar
Apr - Oct 2013 | Berkeley, CA
- Simulations to couple 3D metamaterial with a non linear gain medium

### EADS ASTRIUM  | software engineer for purchase department
Jun - Dec 2011 | Munich, Germany
- VBA applications to: 1) update database of purchase department, and 2) follow-up of suppliers' compliance to the norm ISO9001

## AWARDS

| Year | Award | Description |
|------|-------|-------------|
| 2016 | Harvard Leadership Institute | HGSLI Fellow |
| 2014 | Arthur Sachs Fellowship (2 years) | Given by the Fulbright commission $50k |
| 2014 | Jean Gaillard Fellowship (2 years) | Best MIT/Harvard French students $5k |
| 2010 | 4th/357 | Dean's list during BSc year at ESSEC |
| 2009 | Top 1% in France | Entrance exams to business schools |