

# Lucas Durand

Technology Solutions  
Associate

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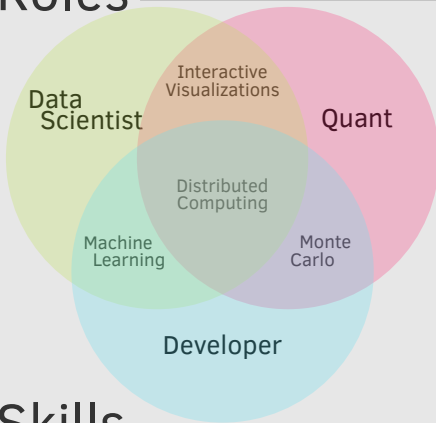


github.com/lucasdurand



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## Roles



## Skills

Statistical Analysis Business Acumen  
Spark MLLib Hadoop Quantitative  
Research Teaching Monte Carlo Angu-  
lar.js Pandas Multinomial Tree POC  
Stochastic Calculus Capital Markets Predic-  
tive Models

## Interests

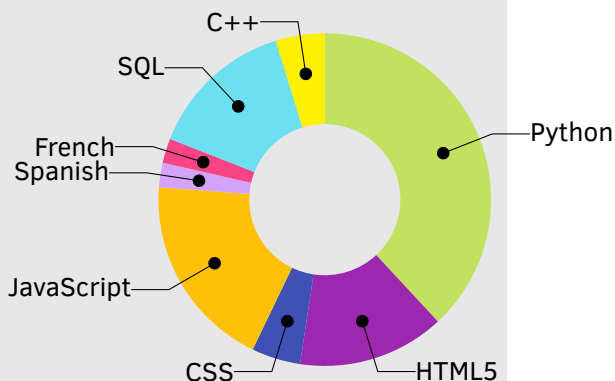
Big Data

Data Visualisation

Quantitative Modelling

Machine Learning

## Languages



## Education

2014 - 2016 **MSc., Theoretical Physics** York University, Perimeter Institute (PI)  
Toronto/Waterloo, Ontario, Canada  
TA: Engineering/Physics Lab; Science, Technology & the Environment

2009 - 2014 **BSc., Physics & Philosophy** Trinity College, University of Toronto  
Toronto, Ontario, Canada  
Senior Thesis – Graphene: Hartree-Fock Analytics and Numerics

## Experience

Feb 2017 -  
Aug 2017 **Quantitative Developer - Associate** TD Securities  
Treasury Analytics Group

- Leverage data visualization tools to deliver interactive mortgage-backed security (MBS) valuation module to business leaders (Matplotlib, Seaborn, Plot.ly)
- Implement parallel computing environment to increase realtime visualization usability (ipyparallel)
- Thorough benchmark and stability testing of quasi-Monte Carlo methods shows marked increase in convergence speed for MBS valuation model, allowing for Key Rate Vega and Convexity hedging (Pandas, C++)
- Strengthened understanding of Financial Engineering and numerical analysis, distilling and transferring knowledge to laymen in a very successful *Lunch n' Learn*, utilising Jupyter RISE to deliver real-time code and animations
- Courses Completed:
  - Udemy - Data Science and Machine Learning with Python
  - Udemy - Taming Big Data with Apache Spark and Python

Aug 2017 -  
Feb 2018 **Quantitative Developer - Associate** TD Securities  
Quantitative Modelling & Analytics Group

- Responsible for development and implementation of sophisticated derivatives pricing and risk models
- Work with Quant team to add new modelling (fixed income and credit derivatives) capabilities to Unified Quant Library (C++)
- Research new methods to enhance XVA capabilities

## Research

2014 - 2016 **Major Research Project** Tulin Research Group  
*inSIDious Matter*

- Phenomenological exploration of a model for an inelastic self-interacting dark matter particle (Mathematica, Scipy)
- Theoretical formulation of scattering quantities by tensor calculus and numerical partial-wave analysis
- Determination of valid parameter-space for theory in agreement with predictions from N-body simulations and astronomical observations
- New efficient techniques for numerically determining scattering cross-sections in the classical regime are implemented
- Visiting Researcher at the Perimeter Institute for Theoretical Physics

## Experience cont'd

Jul 2016 -  
Feb 2017

### **Business Systems Analyst - Associate** Enterprise Fraud Analytics Program

TD Bank Financial Group

- Subject Matter Expert (SME) for Identity & Access Management. Developed Role-Based Access Management tools to automate RBAC reporting (Pandas, Excel, Selenium)
- Interfaced between business and Testing Centre of Excellence to facilitate continuous testing on vendor platform delivery.
- Completed Courses:
  - Global Knowledge - IBM BigInsights Foundation with Hadoop
  - Coursera (Columbia University) - Financial Engineering and Risk Management Part I

Sep 2014 -  
Apr 2016

### **Teaching & Research Assistant**

York University, Tulin Research Group

- Maintained a broad knowledge of general science to lead tutorials in *Science, Technology & the Environment* as well as weekly topics relevant to *Engineering/Physics Labs*.
- Worked to promote a holistic understanding of difficult concepts through the use of qualitative, quantitative, analytic and synthetic thinking while efficiently assessing a high volume of student problem sets and assignments.

Apr 2014 -  
Sep 2015

### **Application Analyst - Intern** Equities Trade Support

National Bank Financial Markets

- Worked on NBFM trading floor, directly interfacing with institutional equities, direct market access, and discount brokerage traders
- Created ETL framework and Tableau dashboards to provide meaningful business insights from global equities trade data, leading to the adoption of Tableau Server across the LoB
- Designed and implemented `angular.js` Big Data POC for legal compliance reporting. Consolidated data from legacy Sybase servers into local SQLite database to increase search speeds by 1000%
- Explored use cases for `Bokeh`, `d3.js` for visualising real-time market data

## Volunteering

Annual

### **Benefit Concerts**

March of Dimes, ABC for SickKids, AIDSbeat, Big Brothers Big Sisters of York, Rock for LIFE, AUSUM Charity for Autism

2014 -  
Present

### **UofT Physics Department** Mentor

Jul 2014 -  
Present

### **TD Associate Knowledge Academy**

*Lunch n' Learn* Presenter, Group Learning Coordinator, Associate Fireside Chat Creator

### **TD Co-op Mentorship Committee**

Executive, Mentor