# Lucas Durand
## Quantitative Analyst

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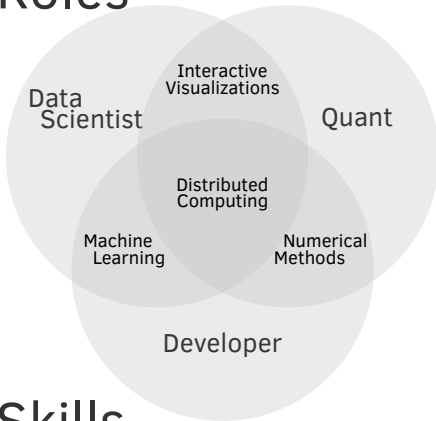
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## Roles



## Skills

Statistical Analysis Business Acumen Spark MLLib Hadoop API Teaching Agile Monte Carlo ReactJS Pandas Multinomial Tree PoC Stochastic Calculus ChatBots Capital Markets Predictive Models
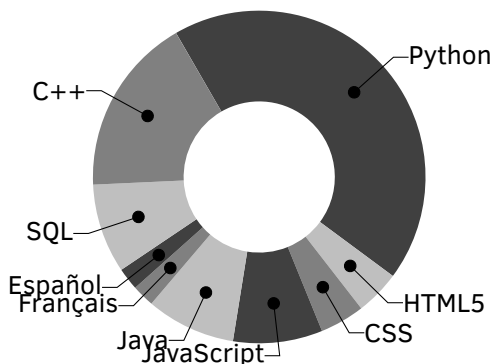
## Interests

Big Data

Visualisation

Quantitative Modelling

Machine Learning

## Languages



C++ — Python — SQL — Español — Français — Java — JavaScript — CSS — HTML5

# Experience

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

`C++`
`Java`

`React.js`
`Node.js`
`Boost`
`Jenkins`
`MLLib`
`Keras`

- Responsible for development and implementation of sophisticated derivatives pricing and risk models, exposing functionality to Excel and Java interfaces
- Deliver Testing Harness PoC to perform continuous integration testing between local, server, and downstream valuation platforms
- Implement infrastructure to expose library to Python, integrate with build
- Led Machine Learning group learning course. Cover key Data Science technniques with ongoing projects
- Winner of TD Bank's Hackathon with development of novel model to predict customer life moments
- Develop network of Chatbots, providing easy access to a variety of useful data and algorithms

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

`seaborn`
`plotly`
`pandas`

`Jupyter RISE`

`scikit-learn`

- Leverage data visualization tools to deliver interactive mortgage-backed security (MBS) valuation module to business leaders
- Benchmark and stability testing of quasi-Monte Carlo method allows for Key Rate Vega and Convexity hedging
- Presented *Lunch n' Learn* featuring real-time code execution and animations
- Courses Completed:
  - Udemy - Data Science and Machine Learning with Python

# Research

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

`Mathematica`
`Scipy`

- Phenomenological exploration of a particle physics model for an inelastic self-interacting dark matter
- Theoretical formulation of scattering quantities by tensor calculus and numerical partial-wave analysis
- Determination of allowed 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*

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

# Experience cont'd

| | | |
|---|---|---|
| Jul 2016 -<br>Feb 2017 | **Business Systems Analyst**<br>Enterprise Fraud Analytics Program | TD Bank Financial Group |

`pandas`
`Excel`
`Selenium`

- Subject Matter Expert (SME) for Identity & Access Management. Developed Role-Based Access Management tools to automate RBAC reporting
- Interfaced between business and Testing Centre of Excellence to facilitate continuous testing on vendor platform delivery.
- Completed Courses:

`Hadoop`
`Binomial Trees`

  – Global Knowledge - IBM BigInsights Foundation
  – Coursera (Columbia University) - Financial Engineering and Risk Management Part I

| | | |
|---|---|---|
| Sep 2014 -<br>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 -<br>Sep 2015 | **Application Analyst**<br>Equities Trade Support | National Bank Financial Markets |

`Tableau`
`AngularJS`

- Created ETL framework and dashboards to provide meaningful business insights from global equities trade data, leading to the adoption of Tableau Server across the LoB
- Worked on NBFM trading floor, directly interfacing with institutional equities, direct market access, and discount brokerage traders

`SQL`

- Designed and implemented Big Data PoC for legal compliance reporting. Consolidated data from legacy Sybase servers into modern data structure to increase search speeds by 1000%

`Bokeh`
`D3.js`

- Explored use cases for visualisation libraries by analysing real-time market data

# Volunteering

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|---|---|---|
| Annual | **Benefit Concerts**<br>ABC for SickKids, CANFAR - AIDSbeat, March of Dimes - Rock for Dimes, CIBC Run for the Cure, Big Brothers Big Sisters of York, CIBC Rock for LIFE, AUSUM Charity for Autism, Raising the Roof - Sounds of the 6ix | |
| 2014 -<br>Present | **UofT A& S Mentorship Program**<br>Department of Physics Mentor | |
| Jul 2014 -<br>Present | **TD Associate Knowledge Academy**<br>Executive, *Lunch n' Learn* Presenter, Group Learning Coordinator, Associate Fireside Chat Creator<br>**TD Co-op Mentorship Committee**<br>Executive, Mentor | |

# Leadership

| | | |
|---|---|---|
| 2017 -<br>Present | **Second Chair Solutions Ltd.**<br>Director of the Board | |
| 2009 -<br>2014 | **Trinity College Literary Institute**<br>Speaker | |
| 2012 -<br>2013 | **Trinity College Meeting**<br>Deputy Chair | |