Oliver De La Cruz / *Data Scientist*

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Education

Swiss Federal Institute of Technology, ETH Zurich — **Switzerland**
Master of Science in Statistics, Data Science — *October 2016 – November 2018*
Honors: Magna Cum Laude, Rank: 3th/35

University of Lausanne, HEC Lausanne — **Switzerland**
Master of Science in Finance, Financial Engineering and Risk Management — *September 2011 – September 2013*
Exchange Program in U.S: MFE - Claremont Graduate University - Fall 2012
Honors: Cum Laude, Rank: 5th/67

University of Luxembourg — **Luxembourg**
Bachelor of Science in Economics and Management, Econometrics — *September 2008 – September 2011*
Exchange Program in Sweden: B.Sc in Economics - Örebro University - Fall 2010
Honors: Magna Cum Laude, Rank: 3rd/88

Professional Experience

Amazon EU - Supply Chain Research — **Luxembourg**
Data Scientist Intern — *October 2017 – February 2018*
Conducted a research project on unsupervided machine learning methods to discover patterns for time series data using deep learning algorithms and cloud computing leading to a cost reduction in inventory placement by 10%.

- Built robust and scalable data integration (ETL) pipelines with SQL, Python and Spark
- Trained a Deep Embedded Clustering to learn feature representations and cluster assignments for outlier detection
- Engineered as a solution architect a web application in a secured Virtual Private Cloud with a multilayered architecture
- Provided technical expertise on RDBMS and administered a columnar petabyte-scale data warehouse in AWS (Redshift)

Ernst & Young - Quantitative Advisory Services — **Luxembourg**
Senior Quantitative Analyst — *October 2013 – October 2016*
Performed independent valuation on a range of over-the-counter derivative products using internal models and contributed to the successful IT setup of a web-based business intelligence platform offering market analytics with interactive data visualization.

- Validated and monitored Value at Risk models for hedge funds and banks across Europe
- Generated ad hoc reports to gain insights on credit risk, factor sensibilities and stress testing
- Reviewed portfolio management processes and investment strategies to ensure consistency with the client's risk profile
- Performed data analytics by integrating statistical methodologies with Python to determine trends in the fund industry
- Developed an containerized application in Matlab to price convertible bonds by implementing finite difference methods
- Established a database to compute the retrocessions fees for a client and programmed in SQL to estimate the profit margins

European Investment Bank - Finance Directorate — **Luxembourg**
Analyst Intern — *February 2013 – July 2013*
Improved the automation of the bank's dashboard by creating a software and coordinated the asset & liability management project across departments to assess the systematic risk in the trading book.

- Provided executive management with daily market risk reporting for fixed income securities
- Designed hedging and investment strategies to reduce exposure to risk factors using derivatives
- Identified data quality issues, upgraded business processes and executed cash reconciliation between the front and back office

Société Générale - Asset Management & Private Banking — **Luxembourg**
Summer Intern — *August 2011 – August 2011*
Increased the efficiency of data storage, enhanced the information retrieval methods in place and prepared presentations analyzing major net asset value fluctuations of institutional funds.

- Created a VBA tool in order to facilitate the task of data processing
- Maintained an up-to-date database for mutual funds, private equity funds and hedge funds

SES Satellite Communications Services - Internal Audit — **Luxembourg**
Summer Intern — *July 2011 & September 2011*
Assisted with the drafting of the annual report delivered to the Board of Directors of the world's second largest satellite operator.

- Overhauled audit procedures and compliance with policies
- Implemented an effective program to monitor key metrics and identify adverse trends and opportunities for improvement

University of Luxembourg - Centre for Research in Economic Analysis **Luxembourg**
Part-Time Research Assistant *May 2011 – June 2011*
Collected market data and applied econometrics for efficient portfolio allocation to support future academic research.

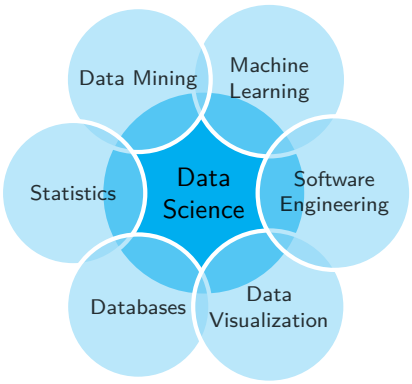
- Conducted periodic backtesting, evaluation and optimization of stock selection models
- Analyzed the financial statements of EU companies and constructed optimal portfolios to beat the Euro Stoxx 50 benchmark

Languages

Spanish: Mother tongue (C2)
French:: Bilingual (C2)
English: Fluent (C2)

Skills

Programming Languages: Python, R, C++, Scala, Matlab, SQL, JavaScript
Libraries: Numpy, Pandas, Scikit-Learn, Tensorflow, Caret, Ggplot2, Plotly
Big Data: Hadoop MapReduce, Apache Spark, Hbase, Hive, MongoDB
Databases: PostgreSQL, SQL server, MySQL, Redshift, MongoDB
Web technologies: HTML, CSS, jQuery, AJAX, XML, JSON
Frameworks: Django, React, Angular, Shiny, Bootstrap
Software Development Tools: Git, Github, Docker, Tmux
Operating systems: Microsoft Windows, Apple Mac OS X, Linux
AWS: EC2, S3, VPC, IAM, RDS, ELB, Elastic Beanstalk, CloudFormation



Research & Projects

Conversational Agent, Project
The task is to build a simple dialogue system that can handle real-world conversations. Starting from a simple Seq2Seq implementation, one needs to identify limitations of the baseline and suggest extensions that tackle with speficic problems.

- Programmed an local attention and copying mechanism with a LSTM 4-layer neural network
- Applied reinforcement learning to produce better answers

Sentiment Analysis, Project
The task is to predict if a tweet message used to contain a positive or negative smiley by considering only the remaining text. We developed a multi-step method consisting of preprocessing, word-vector embeddings, and classification using deep learning.

- Parsed sentences to build dependecy trees and estimated word embeddings with Word2vec or Glove approaches
- Calibrated a 3-layer convolutional neural network with max pooling and batch-normalization

Dynamic Factor Models for Asset and Liability Management, Master Thesis
The paper advocates term structure models which parsimoniously exploits unobserved information with the objective of forecasting interest rates and predicting future bond prices.

- Formulated a Vector autoregression (VAR) model to capture linear interdependencies among multiple time series
- Applied dimensionality reduction techniques to large number of macroeconomic variables
- Developed a Kalman Filter algorithm to estimate the latent yield curve factors

Deep Reinforcement Learning for Autonomous Exploration, Master Thesis
The thesis proposes deep reinforcement learning methods that are able to navigate in complex unknown environments attaining a performance close to human-level intelligence.

- Included auxiliary tasks in the loss function to deal with the sparsity of the rewards and extract meaningful features
- Parallelized policy gradient methods to run in distributed systems using asynchronous optimization with multiple GPUs
- Integrated a external memory which acts as internal representation of the map

Activities & Achievements

Leadership: Organized conferences, presentations and events for the Alternative Summit in Las Vegas
Awards: Co-winner of Stock Market Trading Game competition
Certifications: Passed CFA Level II