

William MARTINO

Curriculum Vitae

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Profile

I revel in being thrown a sufficiently difficult problem or large dataset and having to find the solution without being told the question. Being around a good team is key. Intelligent, driven, genuine, and curious people are a must - these are personal traits that I like to see in others which I do my best to exhibit myself. When left to my own devices I'll seek out things that I don't yet understand and the people who understand them.

I'm always interested in discussing hard problems. Feel free to reach out if you have one & think I may be interested.

Education

2006 - 2010 **Mathematics & Economics**, *Yale College*, New Haven, CT
Research Experimental Mathematics: applications of Fractal Geometry to Times Series data
Course Work Time Series Analysis
General Equilibrium Theory
Financial Calculus
Complex Analysis

Experience

2/2013 – Present **Senior Science Advisor**, *Securities and Exchange Commission*, New York, NY
“Head of Tech” of the Quantitative Analytics Unit in the SEC’s National Exam Program. My scope of responsibilities was quite wide with the common thread being the subject involving electricity at some point, ranging from designing our servers & computer lab to analyzing HFT data to being the Lead Engineer of the National Exam Analytics Tool (NEAT). Unfortunately the details of NEAT are not yet public but NEAT comprised many firsts for the SEC:

- First internally built software tool
- First tool created at no cost of the American Taxpayer (it uses free and open source technology)
- First implementation of algorithmic regulation
- First proof of concept that “embedded agile” development can work for the SEC

NEAT was such a wild success that it has been deployed to over one thousand desktops nationwide in the SEC and is being incorporated into the core of the National Exam Program. For a broader description the QAU’s role and what I worked on regularly, the below quote from the Financial Times will have to suffice:

The [Quantitative Analytics Unit] is part of the SEC’s examination program and is staffed with PhDs who have spent on average more than a decade in the industry building trading systems, statistical analysis and models. It was launched... out of a need to understand better and respond to the rapidly changing computer-driven strategies that dominate the modern market and present compliance and regulatory challenges. The staff’s technical knowledge is being shared within the agency and externally, including at recent meetings with the FBI, to highlight risks and potential areas of market manipulation.

SEC Prompted to Join Tech War

4/2007 – Present **Researcher** *Yale University*, New Haven, CT & Remote
Created a new fractal geometry based approach for analysis of time series data. Developed algorithms and tools to apply and test the approach. These programs and tools have application in a variety of academic and industrial settings and over diverse data sets such as financial data and fetal heart rhythms. Resulting publications can be found below.
This research is still ongoing and likely always will be in my free time, just in a more diminished fashion. Recently, I’ve begun working on a Wavelet Based approach which has been showing better results. My latest work can be found in my github repository wtmm-python.

10/2012 – 2/2013 **Software Engineer**, *AxialMarket*, New York, NY
Worked on building out the Data Analytics and Science backend. Reoriented the paradigms used for data collection and consumption. Retooled Axial’s (then) current front end to analytics solution. Worked mostly in Python and Shell on AWS. My experience there was fantastic and it taught me a huge amount about both development and UNIX.

1/2012 – 9/2012

Quantitative Researcher (Consultant), Barca Capital, Remote

Engaged to develop fractal geometry approach to evaluating bond information in emerging markets to determine yield appropriate long tailed distributions for use in Monte Carlo simulations.

3/2011 – 7/2012 **Support Analyst, ION Trading, New York, NY**

Senior leader on the dealer to dealer fixed income support desk. Facilitated maintenance and enhancement of trading tools that aggregate market data, create synthetic tradable spread instruments, and monitor key performance metrics including P&L, position and risk. Advised major financial institutions on optimization of software systems, the mitigation of latency and general strategy.

6/2008 – 8/2008 **Summer Intern, Stern Fisher, New Delhi, India**
Entrepreneur Business Plan Consultant

6/2005 – 9/2005 **Co-Author/Researcher, Yale University, New Haven, CT**

Worked under Professor Juan de la Mora of the Mechanical Engineering department at Yale. During this work, I uncovered that the results of two years worth of worldwide measurements of ionic liquids were skewed by contamination and that a widely accepted, scientific measurement method was incorrect. Redesign of the methodology yielded not only the desired information but also was the subject of a paper that was published in a leading chemistry journal on which I was awarded first name.

Education ∩ Research ∩ Experience

1/2015 – 3/2015 *Hacker School, New York, NY*

Topics Wavelet Based 1-Dimensional Clustering Algorithm

Creating a database optimized for dense, write once, Time Series data domains

Languages Studied Haskell, JS

Publications

2015 **Multifractal Measures of Time Series: Curvature Surfaces of $f(\alpha)$ Curves**

W. Martino and M. Frame, Mandelbrots Memorial Journal (Soon to be published) Designed a new method for deriving the curvature of the surfaces generated by the algorithm. Showed the connection between the systems memory and output of the algorithm.

2013 **Fractal and Multifractal Geometry: Scaling Symmetry and Statistics**

W. Martino and M. Frame, Wiley Interdisciplinary Review: Computational Statistics, December 2011. General overview of Fractal Geometry – the paper was requested by the publisher.

2010 **Multifractal Measures of Time Series: $f(\alpha)$ Surfaces**

W. Martino and M. Frame, The International Journal of Bifurcation and Chaos 20.8 (2010) pp. 2453-2470. Research developed better understanding of the underlying local fractional dimensionality and value related to volatility of data sets as well as a means towards understanding a given system's intrinsic memory.

2006 **Surface Tension Measurements of Highly Conducting Ionic Liquids**

W. Martino, J. Fernandez de la Mora, Y. Yoshida, G. Saito and J. Wilkes, Green Chemistry. Winter 2006, p. 390- 411 Completely revamped the methods used to measure surface properties of Ionic Liquids. Work invalidated much of the previous published work on this topic and widely accepted scientific methodology.

Interests ∪ Hobbies

Technical Arduino Development & Hardware Hacking, Statistical Learning, Automation of Regular Activities, Keyboards, UNIX (generally), Web Development (generally)

Travel India, Nepal, Australia, New Zealand, France, Italy, England, Dubai UAE

Personal Snowboarding, SCUBA, Surfing, Lacrosse (Goalie)