

# Catching FIRE

THE OFFICIAL NEWSLETTER OF THE NYU TANDON DEPARTMENT OF FINANCE AND RISK ENGINEERING



# Letter from Department Chair: Peter Carr



**According to the wiki entry on “Financial Engineering,” the financial engineering program at New York University Polytechnic School of Engineering was the first curriculum to be certified by the International Association of Financial Engineers (IAFE).** This

certification would have been in the mid-nineties, before many of our students were born. Since that time, “Poly” has become Tandon and the IAFE

has become the IAQF, the International Association of Quantitative Finance. The names of the players may have changed, but some of the fundamental principles that we have taught since our inception over a quarter of a century ago remain as relevant today as they were back then. In particular, finance remains a relationship business, despite ever increasing automation.

Notwithstanding the successes enjoyed by the financial industry while its employees worked from home during the current pandemic, this summer will mark a return to the office for most of the finance industry. Gigantic trading floors will again be filled to capacity

with hordes of screaming traders, as if the reality of the past year was nothing but a faded dream, or a nightmare depending on your view. The importance of place for establishing relationships in the finance industry cannot be underestimated, as the very name of our Wall Street industry constantly reminds us. Like Wall Street, NYU has decided that higher learning is also a relationship business, so we are returning to fully in-person classes this fall. I personally look forward to meeting both the first-year class and the second-year class in-person this fall for the very first time. Both cohorts should stay tuned for some very exciting events to mark our return to campus this fall.

# Faculty News:

The global pandemic has forced the entire world to slow down. However, this epidemic has not curtailed Peter Carr's academic calendar. Instead of losing momentum over the past year, Peter has presented lectures via Zoom, collaborated and published papers with colleagues, and been involved in many committees at NYU Tandon and beyond.

Coauthor: Sacha Stoikov



- "Model Free Backward and Forward PDEs for Implied Volatility" *Journal of Derivatives*, Fall 2020, 28, N1, 51-78.
- "Semi-Closed Form Solutions for Barrier and American Options Written on a Time-Dependent Ornstein Uhlenbeck Process" *Journal of Derivatives*, 2020
- "Semi-closed Form Prices of Barrier Options in the Time-Dependent CEV and CIR Models" *Journal of Derivatives*, Fall 2020, 28, N1, 26-50.

Peter celebrates his fifth year anniversary, serving with distinction as Department Chair since May 2016 and the FRE Department.

Currently, he serves on the advisory board of the Volatility and Risk Institute at NYU Stern, which is an interdisciplinary center for research on financial, geopolitical, cyber, and climate risks by scholars, practitioners and policymakers.

During the second half of the spring semester, he's teaching Static and Dynamic Hedging in person at NYU Tandon.

On March 22, he presented a talk, "Bermudian Optionality," via Zoom at the 4th Machine Learning and AI in Quantitative Finance Conference Spring Edition, sponsored by World Business Strategies (WBS).

Peter will also be the invited gala dinner speaker this summer at the Rady School of Management's 13th Annual Society for Financial Econometrics (SoFiE) Conference, scheduled to be held at the University of California, San Diego, from July 15 to 17.

Peter has collaborated with Andrey Itkin (Director, Senior Quant Research Associate at Bank of America, Merrill Lynch, and a Tandon Adjunct Professor of Computational and Algorithmic Finance) on the following publications:

- "Markovian Approximation of Rough lognormal Model" *Risk.net*, November 2019

read at <https://jpm.pm-research.com/content/early/2020/12/23/jpm.2020.1.199>  
The second, "A Tale of Two Tails: Mortality, Size, Volatility and EPU," is tentatively scheduled to appear in Nov 2021.

Copeland graduated at the top of her class with a degree in Economics from the National Taiwan University and received a full fellowship from UCLA's Department of Finance doctoral program, becoming the first woman to earn a Ph.D. there. She subsequently joined the Bear Stearns Option Department as a Risk Arbitrage Proprietary Trader, followed by posts as Vice President at NatWest Equity Arbitrage Group and Senior Portfolio Manager at Salomon Smith Barney. She next launched a large market neutrality fund for Citi Alternative Investment and was later recruited by Fidelity as a Risk Manager for its trading floor. At Tandon, she has co-taught courses in Valuation and Hedge Funds, as well as in Quantitative Equity Investing. On April 1 of this year she presented a BQE Lecture entitled "A Tale of Two Tails: Size, Volatility and Uncertainty."

## Maggie Copeland



Adjunct Professor Maggie Copeland recently had two papers accepted for publication in the *Journal of Portfolio Management*. Both were co-authored by FRE students Koda Song and Zhitong Lai. The first, "Implied Mortality for the Firm: The Market Tells the Tails," was presented at the 2020 IRMC conference and can be

# Staff Updates



## Carmen Montes De Oca

Last spring, Carmen Montes De Oca, Director of Operations, graduated with a master's degree in Environmental Policy and Sustainability from the NYU Gallatin School of Individualized Study. While she was unable to attend commencement in person, due to the COVID-19 pandemic, everyone at FRE offered her hearty and well-deserved congratulations.



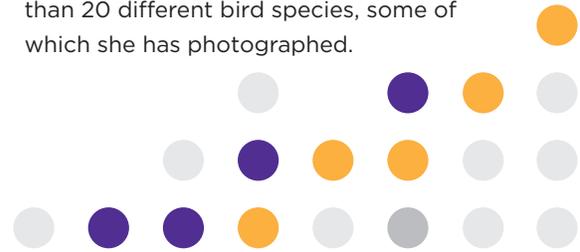
After relocating to Upstate New York to seek a safer environment, Carmen became an avid bird watcher and now participates in **Project FeederWatch**, a citizen-science project that invites birders to periodically record who visits their feeders from November through April, and share their counts and observations with the **Cornell Lab of Ornithology** and **Birds Canada**.



Growing up in El Salvador, her mother's ancestral homeland, Carmen became fascinated by birds and wildlife from an early age. There she developed a love of nature and observed the biodiversity of the country's rainforest, especially its many birds, such as the colorful **Turquoise-browed Motmot** - El Salvador's national bird.



The data she is collecting allows scientists to track the movements of winter bird populations and study long-term trends in bird distribution and abundance. Carmen also participates in the **Great Backyard Bird Count**, a global four-day event in February that allows volunteers from around the world to count the wild birds they observe and submit the data online, which helps scientists to better understand global bird populations and overall trends that are critical to bird and ecosystem conservation. Carmen's Upstate backyard is regularly visited by more than 20 different bird species, some of which she has photographed.



## Keep Rising to the Top - One Notch at a Time!

Last year, TFE Times listed NYU Tandon as number three on their list of the 2020 Best Master's Financial Engineering Programs. This year, our FRE program has moved up a notch to second place. As reported, NYU Tandon's program is the first to be certified by the International Association of Financial Engineers and was earlier ranked ninth by QuantNet, an online resource for the financial industry.

CareerKarma.com, a jobs-focused platform, has placed FRE in the top four graduate programs to advance a student's prospects. FRE students benefit greatly from having the assistance of our in-house Director of Career Services, Sara DeLusant, who personally helps them with placement opportunities, mock interview sessions, resume writing workshops, and company recruitment efforts.



FRE also recently placed sixth in "The Best 17 Masters in Financial Engineering Programs in 2021," compiled by the editors of the platform Best Value Schools. The M.S. in Financial Engineering is geared towards foundational knowledge in financial mathematics, and students can also select courses in corporate finance, financial markets, risk finance. This allows graduates to assume a wide variety of roles, including those in financial IT and algorithmic trading.



# Brooklyn Quant Experience

## LECTURE SERIES

### Spring 2021 Brooklyn Quant Experience Thursdays at 9:30 AM

**FEBRUARY 4**

Keith Lewis

*A Unified Model of Derivative Securities*

**FEBRUARY 11**

Tom Davis

*A Likely Gamma*

**FEBRUARY 18**

Ed Weinberger

*Pragmatic Information and Market Efficiency*

**FEBRUARY 25**

Doyne Farmer

*How Market Ecology Explains Market Malfunction*

**MARCH 4**

Laura Ballotta

*Fourier-Based Methods for the Management of Complex Insurance Products*

**MARCH 11**

Roza Galeeva

*In Pursuit of Samuelson: Studies of Commodity Volatilities and Correlations*

**MARCH 18**

Viktor Todorov

*Option-Implied Semimartingale Characteristics*

**MARCH 25**

Leon Tatevossian

*Can We Still Blame MBS Hedgers?*

**APRIL 1**

Maggie Copeland

*A Tale of Two Tails: Size, Volatility and Uncertainty*

**APRIL 8**

Samin Ghamami

*The Impact of Collateral and Stays on Financial Stability*

**APRIL 15**

Sasha Stoikov

*Where Statistical Arbitrage Meets Market Microstructure*

**APRIL 22**

George Skiadopoulos

*The Contribution of Frictions to Expected Returns: An Options-based Estimation Approach*

**APRIL 29**

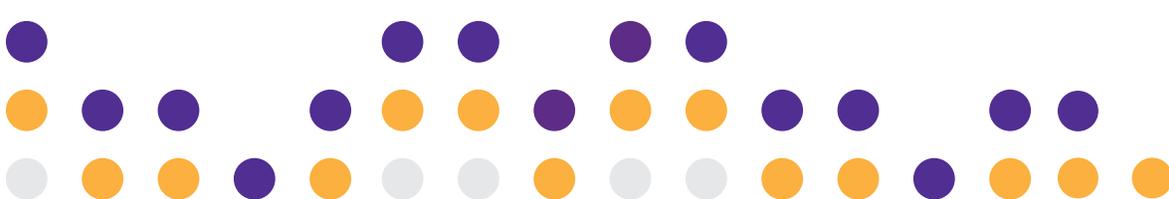
Sandrine Ungari

*A brief history of quant investing - from traditional equity factors to machine learning*

**MAY 6**

Ioana Boier

*Improbable Coincidences*



# Bulls & Bears: Under New Management



**PRESIDENT**  
**Supavitch Nakburee**  
**Class of 2022**



**Education**

B.S. Statistics, Actuarial Science,  
Chulalongkorn University

**Accomplishments**

- Participated in Volatility-Knock-Out research
- Spearheaded quantitative analytics on customer behavior and lifetime value in an online travel agency platform to gain insights on pricing strategies, leading to an increase of \$34 million in company revenue over one year
- Conducted an investment thesis in renewable technologies and genome engineering technology in corporate venture capital
- Facilitated actuarial pricing processes for a high net worth product with the biggest life insurance company in Thailand

- National winner of insurance innovation challenge launched by the Office of Insurance Commission

**Goals for B&B**

Bridge the gap between students and practitioners and build an open space for FRE students to freely express and exchange ideas in quantitative finance

**MANAGING DIRECTOR FOR CORPORATE FINANCE**

**Qin (Kim) Zhang**  
**Class of 2022**



**Education**

B.S. Actuarial Science,  
Minor in Legal Environment of Business,  
Penn State University

**Accomplishments**

- Participated in a government-funded project building the first long term care system in Guangzhou, China. Assisted with on-site claim audits and audit reports while adhering to all guidelines and operating procedures

- Initiated the process improvement project by designing questionnaires for policyholders and analyzed collected data
- Tandon Made Challenge 2020 finalist in the category of Telehealth and Telecommunications; currently developing a prototype of healthcare device that improves remote diagnostic for nursing homes

**Goals for B&B**

Encourage a fun environment where members can meet and work with a group of intelligent and quirky people



## MANAGING DIRECTOR OF TRADING

Sachin Labhishetty

Class of 2021



### Education

M.Sc. Economics and B.E. Mechanical Engineering, BITS Pilani

### Accomplishments

- Top-5 World Finalist at the global UBS Quant Hackathon 2019
- Conceptualized and executed the Nomura FinTech partnership program in collaboration with the senior corporate team <http://voyager.nomura.co.in/#home>
- Developed Process Automations at Nomura, resulting in potential post-production benefit of \$24,000 per year
- Generated long and short ideas for William O' Neil's model portfolio based on CAN SLIM and proprietary O' Neil strategies

### Goals for B&B

To cultivate practical financial acumen and make trading and investing a quotidian activity

## MANAGING DIRECTOR OF DATA SCIENCE

Shengyu (Henry) Huang

Class of 2021



### Education

B.S. Industrial and Systems Engineering, Minor in Business Finance, University of Southern California

### Accomplishments

- Created mixture-based normal distribution risk estimate model and won best Financial Engineering Track Paper at IEOM Washington DC Conference
- Built a neural-networks-based backward stochastic differential equation (BSDE) solver in Python, TensorFlow for European and Bermudan swaption pricing, and benchmarked against Monte Carlo in accuracy, variance, and speed
- Trained an ANN to inversely estimate Heston & ADOL Model parameters from market data

### Goals for B&B

Expose more students to data science, especially the applications of machine learning in the finance industry

## MANAGING DIRECTOR OF QUANT RESEARCH

Ajay Dugar

Class of 2022



### Education

B.S. in Mechanical Engineering, Statistics, and Econometrics & Quantitative Economics from the University of Illinois at Urbana-Champaign

### Accomplishments

- Created a Monte Carlo pricing model of jump-diffusion geometric Asian options
- Researched, modeled, and optimized the supply and demand for Personal Protective Equipment (PPE) during the COVID-19 pandemic in the U.S. using the SEIR compartmental model of disease transfer using R (DOI: 10.13140/RG.2.2.25437.03048)
- Designed, prototyped, and manufactured a 2-axis gimbaled thrust mechanism for CubeSat vectored propulsion

### Goals for B&B

Set up a consistent output of research and whitepaper replication within the Quantitative Research group

# 2021 Cornell Investment Portfolio Case Competition (IPCC)

In February 2021, NYU Tandon's Finance and Risk Engineering Department once again sponsored a team of first-year students to compete in the Cornell University Parker Center for Investment Research's annual IPCC event, under the guidance of Professor James Adams.

The Tandon team members included Ajay Dugar, Filipp Filippov, Zedi Qiu, and Peter Young, and this year's case competition topic addressed the area of impact funds for socially responsible investors. Although the team was not among the finalists, the students gained valuable experience in presenting their ideas directly and concisely to a judging panel of financial practitioners.

This opportunity to envision, construct, and propose portfolios based upon environmental, social, and governance principles using the quantitative skills developed in the FRE program will undoubtedly help these students demonstrate skills and competencies as they seek internships and full-time roles in the financial industry.

## Farewell to Tamar Hofer



We would like to extend a sincere thank you to Tamar Hofer, who served as interim Career Placement Director in the Finance and Risk Engineering Department for the past six months. Tamar worked in this capacity to replace **Sara DeLusant**, who was on maternity leave. Tamar was an integral part of the team and worked closely with our graduating seniors to help them find jobs within the finance industry.

**Sara DeLusant**, who returned to FRE on March 1, is looking forward to reconnecting with students and employers to discover job opportunities for spring 2021 graduates.

# Congratulations to Spring 2021 FRE Graduates

This spring, FRE is hosting a Zoom celebration for graduating seniors in our department. With the cancellation of in-person commencement exercises, we want to recognize those who have successfully completed our program.

Congratulations to all! Completing your degree under unprecedented circumstances is an accomplishment you should be proud of, and we wish you the best of luck! The Zoom call will take place in May 2021. Stay tuned for more details!



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### Comments or Questions?

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### ABOUT Catching FIRE

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