2015 PRACTICUM PROJECT COMPETITION
Each semester, teams of students from the financial engineering master’s program work with industry partners (sponsors) to solve crucial business problems. In addition to their written reports, these student teams do a presentation to an outside panel of judges that include technical and nontechnical peers. The top three teams earn monetary prizes that are made possible by the program and by the generous donations of MSFE program alumni.

FIRST PLACE – $1,500
Title: Back-testing for ETF Arbitrage Opportunities
Team: Arko Bhattacharya, Napat Chutumstid, Christine Vincent, Fei Yang, Ziwei Zhou, Yunke Zou
Company Sponsor: Wedbush Securities
Abstract: The focus of this project was to back-test ETF arbitrage strategies on niche funds using Lime Strategy Studio, which is a C++ trading strategy development platform provided by Wedbush Securities, to explore whether there is any opportunity to profit from the market. Back-tests are performed on full tick-by-tick data to simulate execution, and incorporate realistic institutional trading fees.

SECOND PLACE – $1,000
Title: Anti-Money Laundering
Team: Anthony Ali, Ankita Pant, Shreyas Venkatasubramaniam, Jieyang Weng, Ji-aqi Xie, Jing Xu
Company Sponsor: BMO
Abstract: Money laundering is the process of transforming the proceeds of crime into ostensibly legitimate money or other assets. It is defined as the process of making illegally-gained proceeds (i.e. “dirty money”) appear legal (i.e. “clean”). Typically, it involves three steps: placement, layering and integration. First, the illegitimate funds are furtively introduced into the legitimate financial system. We start with understanding the different processes of laundering money, performing statistical analysis on data sets to understand customer profile and behavior, evaluating a customer’s overall risk profile and finally designing and implementing strategies to weed out potential money launderers.
We primarily base our analysis on Google BigQuery with complimentary use of Perl and Python. We make extensive use of Google infrastructure, including Google Analytics and Google Cloud storage systems. The skills developed over the course of this practicum include Big Data management, Data cleaning, SQL, Perl, regular expressions, Geo-spatial detection and Anti-Money Laundering techniques.

THIRD PLACE – $500
Title: Sentiment Enhanced ETFs
Team: Yoshifumi Ichikawa, Seung Lee, Chuanning Li, Yunqian Li
Company Sponsor: Social Market Analytics
Abstract: Exchange traded funds (ETFs) track the performance of an index or a basket of assets. With high liquidity and low commissions, ETFs provide an attractive product for investors. In a time when online sentiment tracking and “social trading” continue to be integrated into the investment process, this report defines a new class of ETFs by modifying the constituent weights of index tracking ETFs (SPY, XLV, XLY) utilizing social media sentiments as new smart-beta factors. The sentiment data used come from analysis of the lexical content of the Twitter data stream. In general, equities with sentiment signals exceeding a positive threshold are amplified in the ETF constituents, while those with signals below a negative threshold are attenuated. Our formulation includes multiple methods to determine the constituent weightings, evaluating different weighting factors, thresholds and time span of sentiment data. Results indicate that sentiment enhanced ETFs yield better returns, during a 2-year test interval, and have more favorable Sharpe Ratios compared to the original three ETFs, but at the cost of slightly higher transaction fees.
Other 2015 Practicum Projects:

**Title:** Optimizer for Retirement Plan  
**Team:** Chongda Liu, Xiaoyun Hu, Zhengxun Zhang, Zhongkai Du  
**Company Sponsor:** Ash Brokerage  
**Description:** Gauging the optimal place of annuities in retirement accounts

**Title:** Optimal Hedging Strategy Analysis  
**Team:** Cheng Min, Jinfai Tan, Jing Liu, Qi Xu, Shuanghai Sun, Ziwei Xu  
**Company Sponsor:** BP  
**Description:** Designing optimal hedging techniques for refined product

**Title:** Theoretical Option Pricing on the Maxeler Platform  
**Team:** Hassan Ilyas, Zilan Lin, Chi Mu, Sittichok Thanomkulrat, Lishi Wang, Yizhong Zhou  
**Company Sponsor:** CME  
**Description:** Understanding and using CME data stream to calculate options prices at high speed

**Title:** A Study of the Federal Reserve Announcement  
**Team:** Nigel Chan, Mina Gad, Bin Li, Fo-Han Lin, Di Xiao, Tanran Zheng  
**Company Sponsor:** CME  
**Description:** Designing strategies that utilize the dynamics of Order Book changes and programming in Maxeler

**Title:** Liquidity Profile for Two Bond ETFs  
**Team:** Xiaoling Chen, Alexander Kment, Sankalp Krishnan, Xiao Liu  
**Company Sponsor:** MarketAxess  
**Description:** Anticipating bond trading adjustments that result from the FI ETFs creation and redemption process

**Title:** Maximizing Returns on Lending Club's Peer-to-Peer Lending Platform  
**Team:** Chaehyun Pyun, Troy Sieburg, Mark Yakhou  
**Company Sponsor:** PeerEx  
**Description:** Using Lending Club’s historic data set to design a portfolio of personal loans.

**Title:** Predictive Models for Volatility Indexes for Individual Equities Stocks’ VIX with Twitter Sentiment Scores  
**Team:** Anadi Gaur, Jiawei Lu, Zeyang Peng, Weixi Yu, Guohao Wang, Song Zhang  
**Company Sponsor:** Social Market Analytics  
**Description:** Investigating Sentiment Indicators for Sectors instead of individual names.

**Title:** Portfolio Risk Management Using Value at Risk, Key Duration and Spread Duration  
**Team:** Sadik Atalay, Zesheng Chu, Yanfei Mao, Hendro Sugandi, Hanqing Wang, Yumeng Zhang  
**Company Sponsor:** University of Illinois Treasury  
**Description:** Designing a GUI for the UIUC treasurer to be able investigate investment strategies based on historical scenarios.

**Title:** Algorithmic Trading Strategies for After-Hour Trading Period  
**Team:** Qi Liang, Michael Pan, Yash Shah, Tiwari Prakhur  
**Company Sponsor:** Wedbush Securities  
**Description:** Calculating the returns and strategies available from after-hours trading. Comparing Lit vs Dark hours Betas

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**Illinois Team Shares Victory at IAQF Academic Competition**

A team from Illinois’ MSFE program was one of four winners of the 2015 IAQF Academic Affiliate Membership Student Competition. Students were asked to develop a product which can be used to reduce the risk in defined benefit pension plans, and 25 papers from 17 schools were submitted. Four teams were selected as winners in a four-way tie, with each awarded a share of $2,000 and invited to present their solutions at an IAQF sponsored event in New York.