The Center for Research toward Advancing Financial Technologies

Industry Advisory Board Meeting

March 30-31, 2023

Overview

This meeting is jointly hosted by Rensselaer Polytechnic Institute and Stevens Institute of Technology. CRAFT is an industry-university cooperative research center funded by the National Science Foundation.

Featuring:

- An introduction to CRAFT and the industry-university cooperative research center model.
- Keynotes: "Fintech Venture Capital and Start-up Ecosystem" and "Fraud and Anomalies Detection in Financial Services."
- Cutting-edge fintech research project presentations.
- Panel discussion on the commercialization of fintech innovations.

This event will be hosted in a hybrid format.

- Virtual attendees should indicate they are attending virtually when **registering** and join based on the instructions provided after registration.
- In-person attendees should report to the Howard P. Isermann '42 Auditorium in the Shirley Ann Jackson, Ph.D. Center for Biotechnology and Interdisciplinary Studies at Rensselaer Polytechnic Institute. For directions, view the **campus map**.

Agenda — March 30, 2023

7:30-8:30 a.m.	**Registration, Breakfast, and Networking**
8:30-9:00 a.m.	**Workshop Opening:** Welcome from Rensselaer Polytechnic Institute and Stevens Institute of Technology • 8:30-8:40 a.m. CRAFT Co-director and Workshop Chair and Director's welcome **Welcome Addresses from University Leadership** • 8:40-8:55 a.m. RPI Provost (Professor Mary Simoni) and Vice President of Research (Professor Robert Hull) • 8:55-9:00 a.m. Stevens Institute Vice President of Research (Professor Edmund Synakowski)
9:00-9:15 a.m.	**Vision, Capabilities, and Value Proposition of CRAFT** • CRAFT Director and Co-Director
9:15-10:00 a.m.	**NSF Presentation on the I/UCRC Model** • NSF Program Director and Evaluator
10:00-10:15 a.m.	**"Showcasing Prospective University Partners"** • University of Connecticut
10:15-10:30 a.m.	**Coffee Break**
10:30-11:00 a.m.	**Keynote: "Fintech Venture Capital and Start-up Ecosystem"** Speaker: Jeff Stewart, Cofounder and Managing Director, Global Public Offering Fund Chair: Steve Yang
11:00-12:15 p.m.	**Project Proposal Presentations** Chair: Steve Yang **Project Theme: "Blockchain, DeFi, and Social Media Analytics"** 1. "Extending and Simulating Decentralized Exchanges Made by Automated Market Makers," PI: Zachary Feinstein (Stevens) 2. "Blockchain Interoperability for Business Organizations," PI: Oshani Seneviratne (RPI) 3. "DeFi: Scaling Decentralized Automated Market Makers," PI: Ivan Bakrac (Stevens) 4. "Systemic Risk Implications of Central Bank Digital Currencies," PI: Zachary Feinstein (Stevens) 5. "A Neural Embedding-based Framework to Analyze Fintech-Related Social Media Discussions," PI: Lydia Manikonda (RPI)
12:15-1:15 p.m.	**Lunch**

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1:15-1:45 p.m.	**Keynote: "Fraud and Anomalies Detection in Financial Services"** Speaker: Rick Hoehne, Sr. Partner, Leader, Fraud and Financial Crime Center of Competency, Data & Technology Transformation, IBM Chair: Aparna Gupta
1:45-3:00 p.m.	**Project Proposal Presentation** Chair: Aparna Gupta **Project Theme: "Innovations in Machine Learning, Explainability, and Biases"** 1. "Federated Learning for Fairness-Aware and Privacy-Preserving Financial Risk Assessment," PI: Yue Ning (Stevens) 2. "Efficient, Private, and Explainable Federated Learning for Financial Crime Detection," PI: Stacy Patterson (RPI) 3. "Comprehensive Financial Disclosure Lexicon," PI: Elaine Henry (Stevens) 4. "Meme Investor Motivations and Behavioral Impact," PI: Steve Taylor (Stevens) 5. "Counterfactual Explanations for Financial Predictions," PI: Yue Ning (Stevens)
3:00-3:30 p.m.	**Coffee Break and Poster Session**
3:30-4:45 p.m.	**Project Proposal Presentations** Chair: Oshani Seneviratne **Project Theme: "Textual Analytics and Fintech Applications"** 1. "Understanding the Impacts of Technologies on the Value of Occupations," PI: Jeffrey Nickerson (Stevens) 2. "Semantically Enhanced Graph Neural Networks for Event-Driven Financial Impact Analysis," PI: Mohammed Zaki (RPI) 3. "Text-based Reinforcement Learning Framework for Robust Reasoning and Predictive Learning," PI: Lydia Manikonda (RPI) 4. "A Framework to Estimate Spillover Effects in Value Chain Networks," PI: Sebastian Souyris (RPI) 5. "ESG Data: Validity and Certification," PI: Ionut Florescu (Stevens)
4:45-5:30 p.m.	**Panel Discussion: Commercialization of Fintech Innovations** Panelists from Park Avenue Finance, Bank of America, Capgemini, IBM, and Vanguard
5:30-5:35 p.m.	**Note of Thanks and Day 2 Program Overview**
5:35-6:15 p.m.	**Light Refreshments, Networking, and Poster Session**
6:30 p.m.	Reception and Dinner at Hilton (by invitation only)

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Agenda for the CRAFT IAB Meeting on Day 2 is open only to the CRAFT Industry Advisory Board members, CRAFT Academic Leadership Team (ALT), CRAFT-funded project principal investigators, and the NSF Program Director and Evaluator.

7:30-8:30 a.m.	**Breakfast and Networking**
8:30-9:45 a.m.	**CRAFT IAB Administrative Matters** – CRAFT Director and Co-Director
9:45-10:00 a.m.	**"Showcasing Prospective University Partners"** • University of Florida
10:00-11:00 a.m.	**Report Out On Project Progress** (20 minutes each) Chair: Steve Yang 1. "Fast Quantum Methods for Financial Risk Management," PI: Zhenyu Cui (Stevens) 2. "Predictive Learning from Long Financial Documents," PI: Mohammed Zaki (RPI) 3. "High-dimensional Portfolio Design and Optimization Using an Explainable Ensemble Learning Framework," PI: Lydia Manikonda (RPI)
11:00-11:15 a.m.	**Coffee Break**
11:15-12:35 p.m.	**Report Out On Project Progress** (20 minutes each for full projects and 10 minutes each for pilot projects) Chair: Aparna Gupta 1. "Causal Inference for Fairness and Explainability in Financial Decisions," PI: Xu (Stevens – Pilot Project) 2. "Explainable Machine Learning for Credit Risk Analytics," PI: Brian Clark (RPI – Pilot Project) 3. "Risky Business? Deep Dives into DeFi," PI: Kristin Bennett (RPI) 4. "Risk Mitigation in Cross-Platform Decentralized Finance," PI: Oshani Seneviratne (RPI) 5. Discussion on Commercialization of Current CRAFT Projects
12:35-1:30 p.m.	**Lunch and Networking**
1:30-3:00 p.m.	**Feedback From Industry Participants On Projects (Voting)** – IAB Chair and Vice-Chair moderate
3:00-3:30 p.m.	**NSF Closed Session With Industry**

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3:30-3:45 p.m.	**IAB Chair and Vice-Chair Report Out To CRAFT ALT**
3:45-4:00 p.m.	**Next Steps, Action Items, and Closing Remarks**
4:00 p.m.	**Adjourn**

Center Director Bios

Dr. Aparna Gupta

Workshop Chair and Co-Director, CRAFT
Professor of Quantitative Finance, Lally School of Management, RPI

Dr. Aparna Gupta has developed and taught courses in financial engineering and quantitative methods in finance at the undergraduate and graduate levels at Rensselaer Polytechnic Institute. She also teaches short courses in quantitative finance in the Lally School of Management's international initiatives. Dr. Gupta's research interest is addressing issues in risk management at the individual and the institutional level. She serves as the vice chair of the INFORMS Financial Services Section. Dr. Gupta is a member of IAFE, AFA, INFORMS, and SIAM. She has an M.S. and a Ph.D. from Stanford University.

Dr. Steve Yang

Workshop Co-Chair and Director, CRAFT
Associate Professor, School of Business, Stevens Institute of Technology

Dr. Steve Yang's research has been focused on understanding markets' irrationality and impact on trading, portfolio, risk management, and systemic risk using decision science tools such as Markov decision processes, reinforcement learning, and other artificial intelligence (AI) methods. He holds a B.S. degree in aerospace engineering from the Beijing Institute of Aeronautics and Astronautics and a Ph.D. in systems and information engineering from University of Virginia with concentration in financial engineering.

Dr. George Calhoun

Managing Director, Hanlon Financial Systems Center
Teaching Professor, Stevens Institute of Technology

Dr. George Calhoun is a cofounder of InterDigital Communications Corporation (NASDAQ: IDCC), which currently has a market cap of $1.5 billion. He was vice chairman of Geotek Communications, and was chairman of the company's joint venture with a branch of the Government of Israel. Dr. Calhoun was the chairman and CEO of Illinois Superconductor Corporation (AMEX: ISO), a public company focused on the application of high-temperature superconducting materials and advanced signal processing techniques.

About Rensselaer Polytechnic Institute

Founded in 1824, Rensselaer Polytechnic Institute is America's first technological research university. Rensselaer encompasses five schools, over 30 research centers, more than 140 academic programs including 25 new programs, and a dynamic community made up of over 6,800 students and over 104,000 living alumni. Rensselaer faculty and alumni include upwards of 155 National Academy members, six members of the National Inventors Hall of Fame, six National Medal of Technology winners, five National Medal of Science winners, and a Nobel Prize winner in Physics. With nearly 200 years of experience advancing scientific and technological knowledge, Rensselaer remains focused on addressing global challenges with a spirit of ingenuity and collaboration. To learn more, please visit www.rpi.edu.

About Stevens Institute of Technology

Stevens Institute of Technology is a premier, private research university situated in Hoboken, New Jersey, overlooking the Manhattan skyline. Since its founding in 1870, technological innovation has been the hallmark of Stevens' education and research. Within the university's three schools and one college, 7,300 undergraduate and graduate students collaborate closely with faculty in an interdisciplinary, student-centric, entrepreneurial environment. Academic and research programs spanning business, computing, engineering, the arts, and other disciplines actively advance the frontiers of science and leverage technology to confront our most pressing global challenges.

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