LABORATORY FOR FINANCIAL ENGINEERING

The MIT Laboratory for Financial Engineering (LFE) (http://lfe.mit.edu) is a research center created as a partnership between academia and industry, designed to support and promote research in financial engineering and computational finance. The principal focus of the LFE is the quantitative analysis of financial markets using mathematical, statistical, and computational models and methods, drawing upon a diverse set of disciplines including finance, accounting, biology, cognitive neuroscience, computer science, and engineering. The goal of the LFE is not only to spur advances in financial engineering, but also to reach out to students, industry professionals, regulators, and policymakers to support their applications of financial technology in practical settings.

The LFE’s research projects fall into five areas:

- **Foundations of financial behavior and adaptive markets.** Explorations of human behavior in the context of financial markets; an interdisciplinary approach to reconciling human behavior with the ubiquitous Efficient Markets Hypothesis and related theories that serve as the basis for much of modern investment theory and practice.

- **Risk management and systemic risk.** Development of new methods for measuring and managing risks of various types, including systemic risk, in the financial system. A priority is to construct and test early warning signs for instabilities, and to understand the interplay between policy and the financial industry and its impact.

- **Healthcare finance.** Analysis of financial challenges to the biopharma industry and development of new business models and financing structures for raising and deploying funds to support biomedical research and drug development in a scalable and profitable manner.

- **Big data and financial technology.** Applications of machine-learning techniques to consumer credit risk management, portfolio management, drug development, and research on the positive and negative aspects of big data and financial technology, including privacy concerns, cybersecurity threats, and new technologies for addressing these issues.

- **Capital markets and asset-market dynamics.** Explores quantitative models for portfolio management, trading, and asset allocation, including industry-level studies of the hedge fund industry, indexation and smart beta algorithms, and the impact of technology such as high-frequency trading on financial market dynamics.

Students are encouraged to participate in current research projects, which include measuring illiquidity risk in hedge-fund returns; modeling and analyzing the growth of systemic risk in the financial industry, in particular the hedge fund industry; developing evolutionary and neurobiological models of individual risk preferences and financial-market dynamics; developing new approaches to financing biomedical innovation; and examining the public policy implications of this research. The LFE is a research lab for MIT faculty and students and does not offer any degree programs.

Professor Andrew W. Lo is the director of the laboratory. For further information, please visit the website (http://lfe.mit.edu) or contact Jayna Cummings (jcummin@mit.edu), 617-258-5727.