FinTech:
Shaping the Financial World

April 1, 2020
Class 2: Readings

• ‘Artificial intelligence and machine learning in financial services’
  Financial Stability Board (Executive Summary & Sections 1 - 3)

• ‘The Growing Impact of AI in Financial Services: Six Examples’ Arthur Bachinskiy, Medium
Class 2: Study Questions

• What are artificial intelligence, machine learning and deep learning? How do these enhanced tools of pattern recognition and decision making relate to financial services?

• What is natural language possessing? How has it already enhanced user interfaces (UI) and user experiences (UX) in finance? How might chatbots, conversational interfaces and voice assistants transform UI & UX in the future?

• What sectors within the financial services sector has seen the most adoption of AI & machine learning? How can it be used to enhance compliance systems, customer interfaces, risk management, underwriting and investment strategies?
Class 2: Overview

• AI, Machine Learning, & Deep Learning
• Natural Language Processing
• AI within FinTech History
• AI & Machine Learning – Finance
• Natural Language Processing - Finance
AI and Machine Learning

Deep Learning in One Slide

• What is it:
  Extract useful patterns from data.

• How:
  Neural network + optimization

• How (Practical):
  Python + TensorFlow & friends

• Hard Part:
  Good Questions + Good Data

• Why now:
  Data, hardware, community, tools, investment

• Where do we stand?
  Most big questions of intelligence have not been answered nor properly formulated

Source: ‘Deep Learning Basics’ Lex Fridman. Used with permission

https://deeplearning.mit.edu
AI and Machine Learning

DL - => 2010’s => ML with Multi-layer Neural Networks

RL – ML Extracting Features of Data Sets

ML – 1980’s => Machines Improve with Experience

AI – 1950’s => Computers Mimic Human Intelligence
Alternative Data

- Bank, Checking, Employment, Income, Insurance, Tenant, Utilities
- Cash Flow Underwriting

- Consumption and Purchase Transactional Data

- App Usage, Browsing History, Email Receipt, Geolocation, Social Media Data,
- Educational Background, Employer, Occupation, Work History
Natural Language Possessing

• Computer Input, Interpretation and Output of Human Language
• Natural Language Understanding and Natural Language Generation
• Audio, Image, Text and Video including Spoken, Written or Gestured
• Content Generation, Content Summarization, Information Retrieval, Intent Parsing, Sentiment Analysis, Speech Generation, Speech Recognition and Translation
• Chatbots, Conversational Interfaces and Voice Assistants
AI, Big Data and Machine Learning
Financial Stability Board

• ‘The application of computational tools to address tasks traditionally requiring human sophistication is broadly termed ‘artificial intelligence’

• ‘**Big data**’ is a term for which there is no single, consistent definition, but the term is used broadly to describe the storage and analysis of large and/or complicated data sets using a variety of techniques including AI.’

• ‘**Machine learning** may be defined as a method of designing a sequence of actions to solve a problem, known as algorithms, which optimise automatically through experience and with limited or no human intervention.’

Source: ‘Artificial intelligence and machine learning in financial services’ FSB (November 1, 2017)
Customer Interface

Chatbots, CI & Voice Assistants (2010s)

Open APIs (2000s) & Open Banking (2015)

Contactless & Cardless Systems (2000s)

Mobile Payments (2000s) & Wallets (2008)

Internet (1990s) & On-line Banking (1990s - 2000s)

Automatic Teller Machines (1970s)

Credit Cards (1940 – 50s) & Point of Sale Systems (1980s)

Mortgage Brokerage (1890s) & Automobile Indirect Lenders (1910s)

Electronic Payments (1870s), Wires (1910s), ACH (1970s) & Direct Deposits (1970s)

Checks (800s), Negotiable Checks (1500s), & Preprinted Checks (1760s)

Banking - Tents, Temples, Bricks & Mortar (4th – 1st millennium BCE)
Funding & Risk Management

- ML Based Underwriting (2010s) >
- Peer to Peer Lending (2005) >
- Credit Default Swaps (1990s) >
- Asset Backed Securitizations (1970s – 90s) >
- Interest Rate Futures (1970s) & Interest Rate Swaps (1980s) >
- Consumer Credit Scoring (1960s) & FICO Scores (1990s) >
- Consumer Finance Companies & Warehouse Lines of Credit (1920s) >
- Private (1880s, 1950s), Government (1930s) & GSEs (1930s) Mortgage Insurance >
- Bankruptcy & Secured Lending Laws, Loan Servicing & Collection Agents (Days of old) >
- Bank Deposits - (Antiquity) >
AI and Machine Learning - Finance

- Asset Management
- Call Centers, Chatbots, Robo-Advising & Virtual Assistants
- Credit & Insurance - Allocation, Extension, Pricing & Scoring
- Fraud Detection & Prevention
- Regulatory – Anti Money Laundering, Anti Manipulation
- Risk Management & Underwriting
- Robotic Process Automation
- Trading

Image by Lex Fridman. Used with permission.
Natural Language Possessing - Finance

• Customer Services
  • Chatbots, Conversational Interfaces and Voice Assistants
• Process Automation
• Sentiment Analysis
Hi, I am Erica.
See what I can do for you.