The evolving scope of FinTech and AI: examples and opportunities

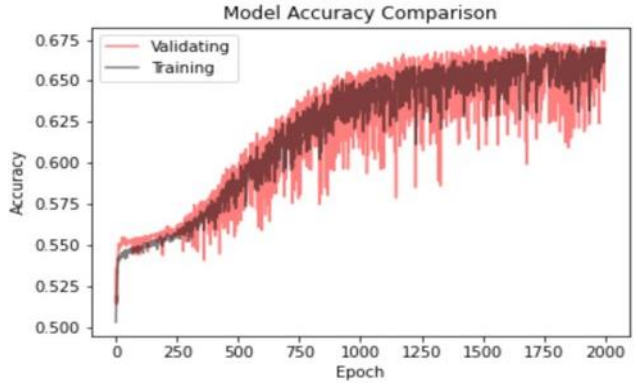
by Sean Cao

University of Maryland

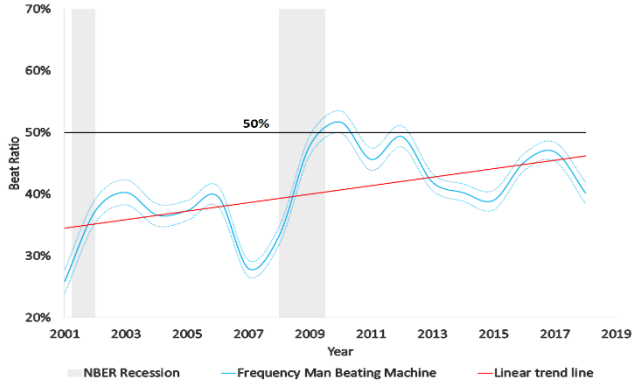
Related AI research

1. Man vs Machine

- An AI stock analyst (Cao, Jiang, Wang and Yang 2022)
  - ***replace*** human intelligence?
  - ***augment*** human intelligence?

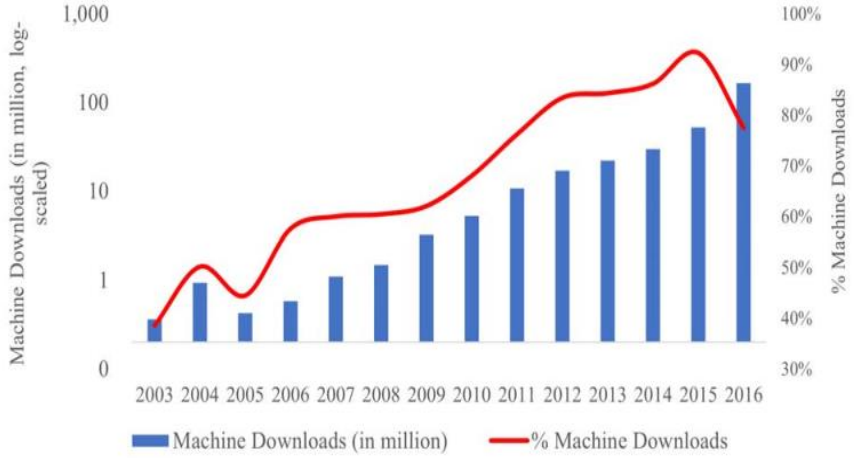


The performance of Man vs. Machine



2. Machine reading news

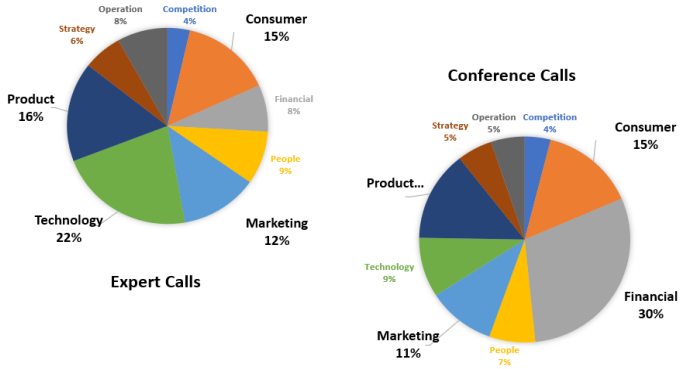
- Trend of Machine Downloads (Cao, Jiang, Yang and Zhang 2022)



Related AI research

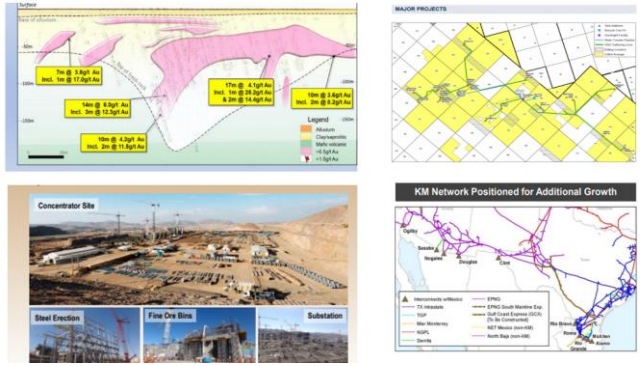
3. Expert Network Calls

- Topic Distribution of Expert Calls and Conference Calls (Cao, Green, Lei, and Zhang 2022)

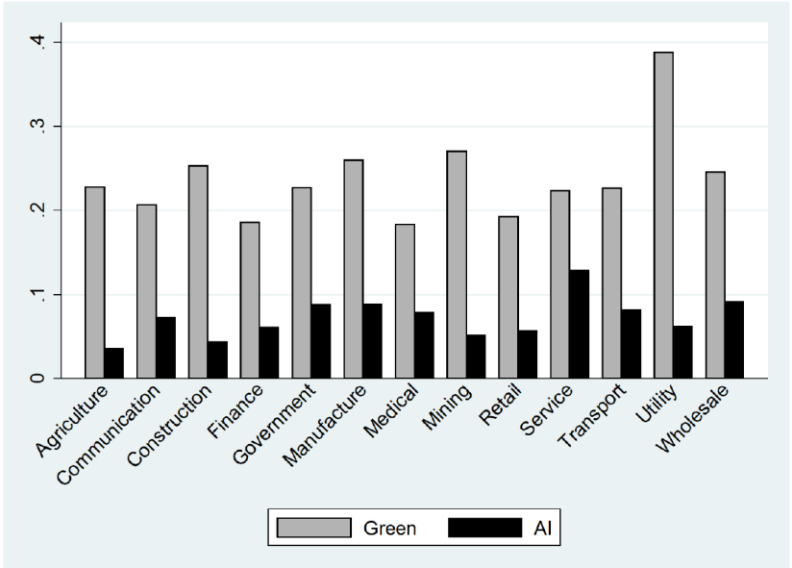


4. Image analysis

- AI techniques for trading stocks based on company production/product images (Cao, Chen, Xia and Yang 2022)



5. Executives learning about future AI and Climate investment



Big data

Information

- Earnings, Balance Sheet, Income Statement
  - Early research: quantitative
- All SEC filings (qualitative disclosures)
  - 8-K, proxy statement, etc.
- Voluntary disclosures
  - Conference call
  - Social media (negative peer disclosure JFE 2021)
  - Digital footprint (copycat JAR 2021)

  (**political risk, climate risk, bank risk, personability, sentiment, many to go**)
- Media
- Any information within a firm
  - e.g. Satellite image, RPI

  Search **Sean Cao google site**

Firm disclosure

Evolution

Not disclosed, but can be extracted

What is AI and big data in accounting?

- AI and Fintech for decentralized finance
  - Industry: Metaverse, Blockchain,Web3, smart contracts, decentralized organization, Blockchain, P2P)
  - Academic research
  - Curriculum
- AI and Fintech for decision making
  - AI and Fintech for stock returns and asset management: ML and NLP in finance
  - AI and Fintech/emerging technologies for household finance: alternative lending, digital payments, robot advisor.
  - AI and Fintech for sustainable and responsible finance: CO2
  - AI and FinTech for startup and small business
  - AI and Fintech for banks, loan contract and credit risk
  - AI and Fintech for cyber security
- Policy for AI and Fintech - RegTech: discrimination, gender issues, AI fairness

Georgia State University

See more at 2020 GSU-RFS Fintech Conference summarizing 500 ML papers

Three common applications for capital markets research

- Sophisticated information retrieval – calculate a novel variable
- ML based forecasting – replace OLS
- Fintech policy: economic consequence of machine learning

The impact of industry or regulatory changes related to emerging technologies? (no ML technics)

Common Challenges in ML studies

- Why only this technology can do the job? Why not others?
- What is the contribution to economic theories in addition to methodologic advancement?
- Can we make the technology understandable to a broad audience beyond the CS audience?

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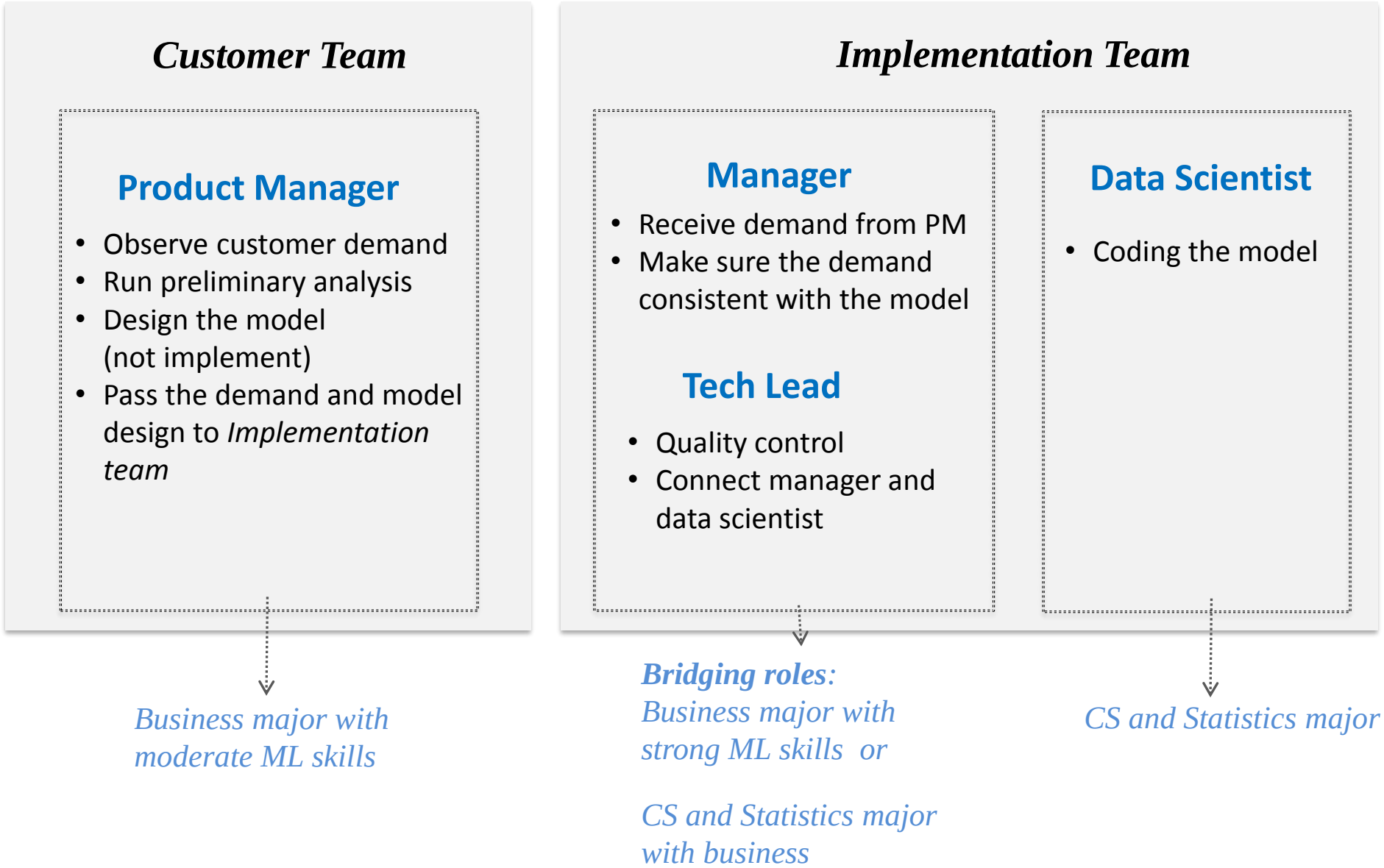
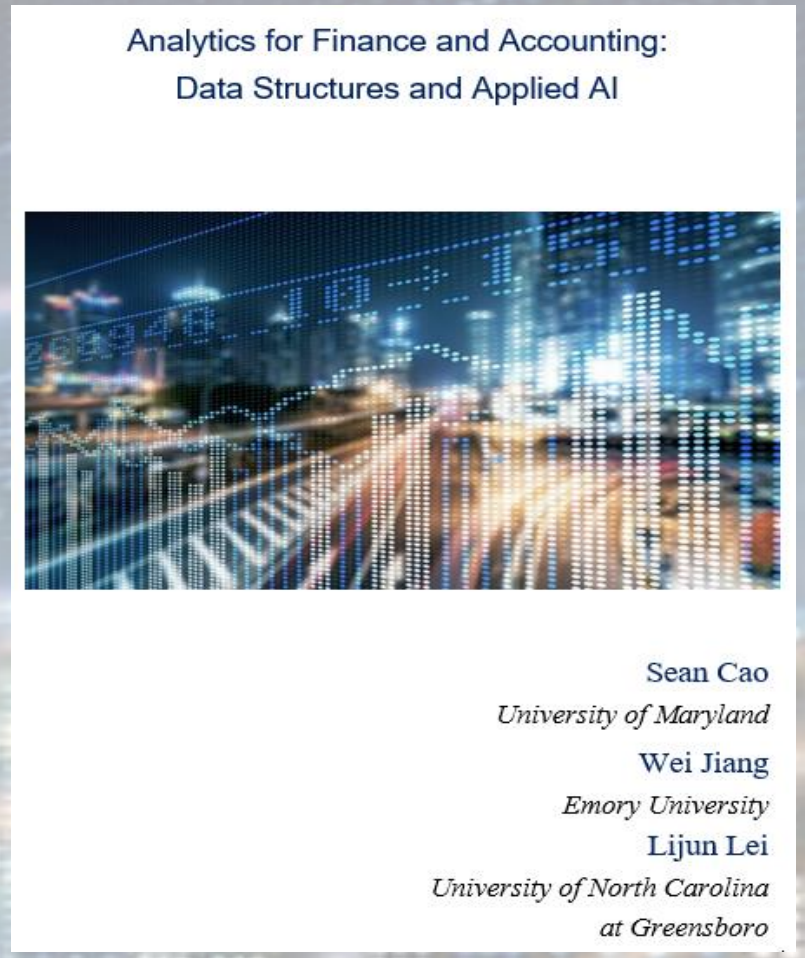

Customer Team
Product Manager
• Observe customer demand
• Run preliminary analysis
• Design the model (not implement)
• Pass the demand and model design to Implementation team
Implementation Team
Manager
• Receive demand from PM
• Make sure the demand consistent with the model
Tech Lead
• Quality control
• Connect manager and data scientist
Data Scientist
• Coding the model
Business major with moderate ML skills
Bridging roles:
Business major with strong ML skills or
CS and Statistics major with business
CS and Statistics major



Analytics for Finance and Accounting:

Data Structures and Applied AI

- **Partner with the Smith AI initiative**
  - **Joint conferences with industries, regulators and leading scholars**
  - **Research visits**
  - **Hosting visiting faculty for research**
  - **Developing AI literacy classes for business students**
  - **Seed funding: $300,000**

Textbook for download

- Analytics for Finance and Accounting: Data Structures and Applied AI

Tutorial videos for download

- Each chapter of the textbook has tutorial videos for instructors and students. Please click the video link in the table of contents of the textbook.

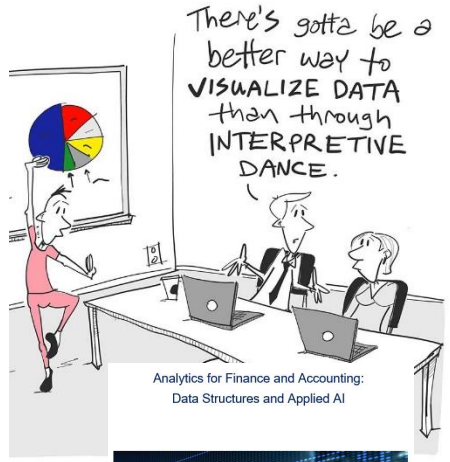
4. Analyzing Conference Calls 59
4.1. Data in conference calls 59
Video Data structure of conference calls
4.2. Standard dependence parser 62
4.3. Empirical example: Contrasting conference calls and expert calls 65
Appendix 3: Using GPT for topic modeling 68
Video Applying GPT to analyze conference call transcripts using both API and web interface

Slides for download

- Tutorial slides

Python tutorial for web crawling and fundamental textual analysis:

- Crawling SEC Edgar
- Parsing 10-K filings
- Applying GPT: analyzing conference call transcripts using both API and web interface



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Bridge data analytics and business domain knowledge
See more at Sean Cao google site

Future opportunities

- Big-data talent
  - big data courses for PhD students
  - textbook for undergraduate and masters
  - non computer science background
- Industry cooperation and academic research