



Artificial Intelligence in Finance
at
Hong Kong University of Science and Technology

Assignment I: Team Project Options



	Kaggle Competition	<u>Entrepreneurship Competition</u>	CogX-AIC Conference	Other
Overview	2-Sigma Kaggle contest in financial modeling	Application details to be can be found here	Also known as “CognitionX”, Europe’s largest AI conferece	Other project(s) initiated by student(s) to be approved by instructors
Scope	Public	Public	Private	Public or private
Team Size	Any	Any	5 members	Any
Internship	No	No	Yes ¹	No
Interviews	N/A	N/A	Required	N/A
Nature	Trading	Various	NLP	Any
Deadline	May 31	April 15	May 31	May 31

Note: 1. High performers will be invited to interviews for full-time positions at Alpha Intelligence Capital.

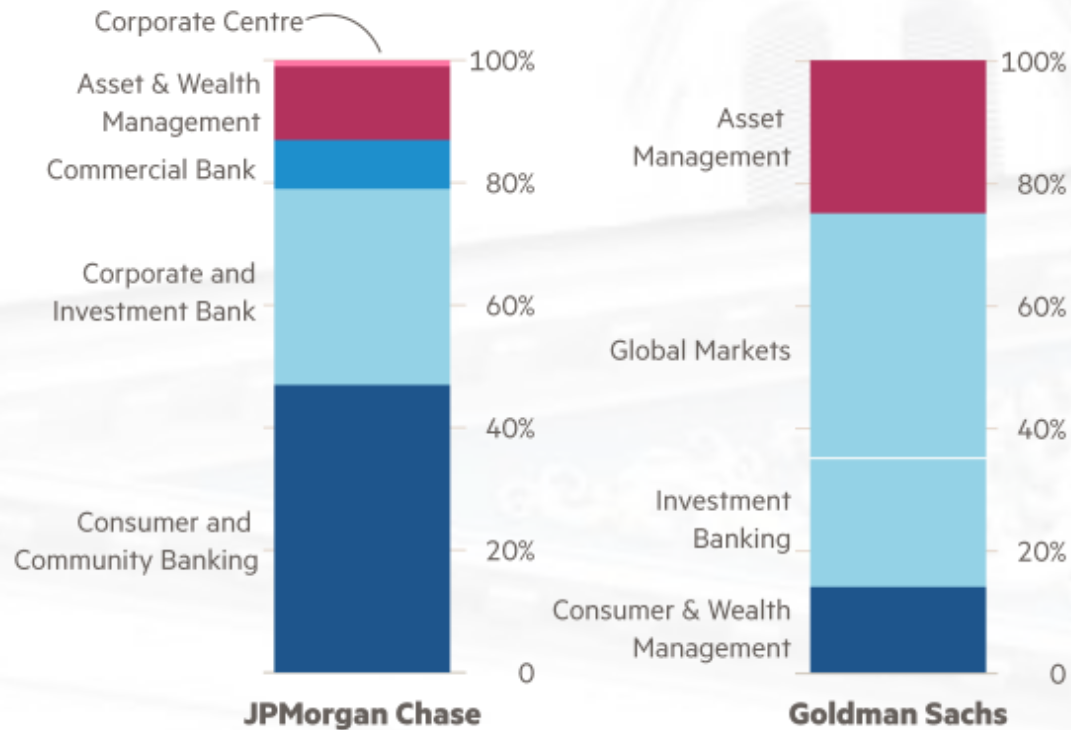
Assignment II: Monthly Article Review

- Optional and due on March 31, April 30, and May 31
- 1-2 articles every month from top journals (e.g. NIPS, ICCV) in the past 5 years
 - Maximum of 6 articles in total for the whole semester
- 1 page review with the following components:
 - Abstract in simple language (in words that your grandmother will understand)
 - What is good about the article or research approach?
 - What may not work regarding the research?
 - What are the potential applications of the research findings?
- More details to be announced soon

Goldman Sachs vs. J.P. Morgan

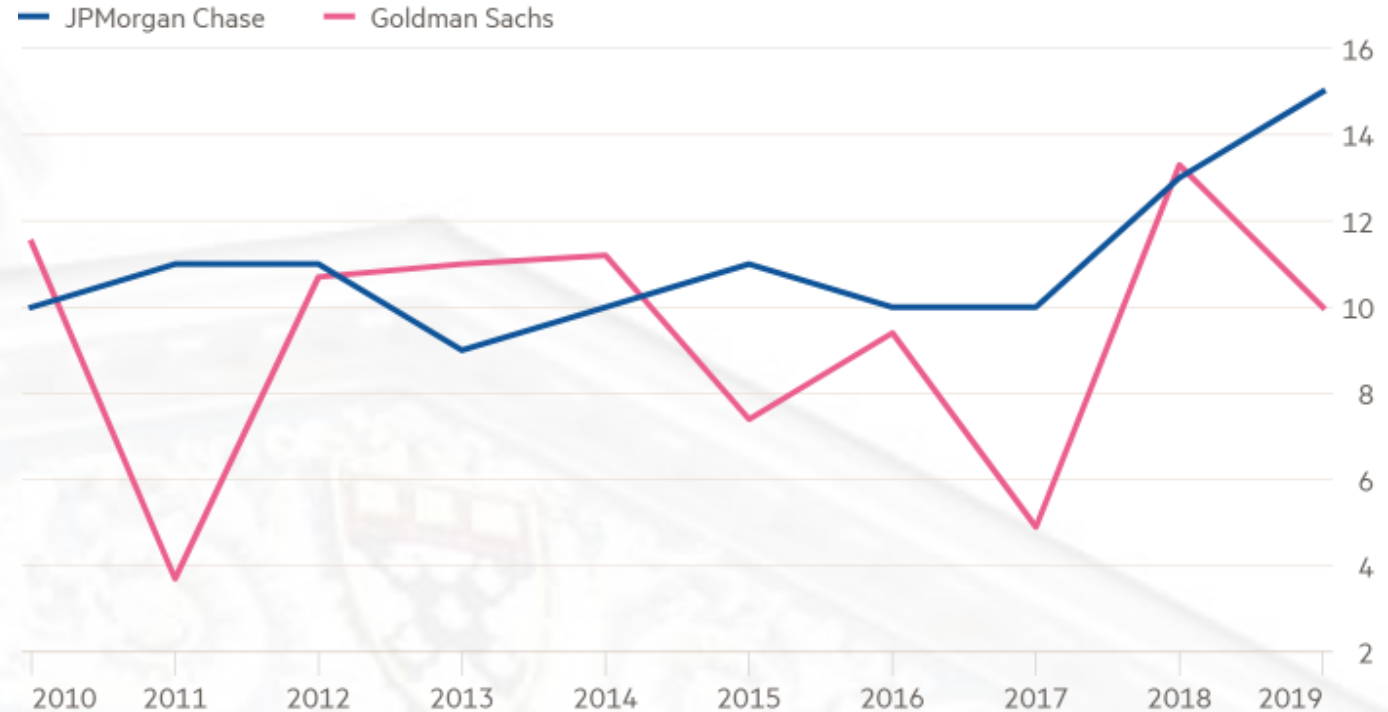
Goldman Sachs' business is heavily reliant on trading and investment banking

Revenue by division (%)



Goldman's profitability has been volatile and lagged JPMorgan

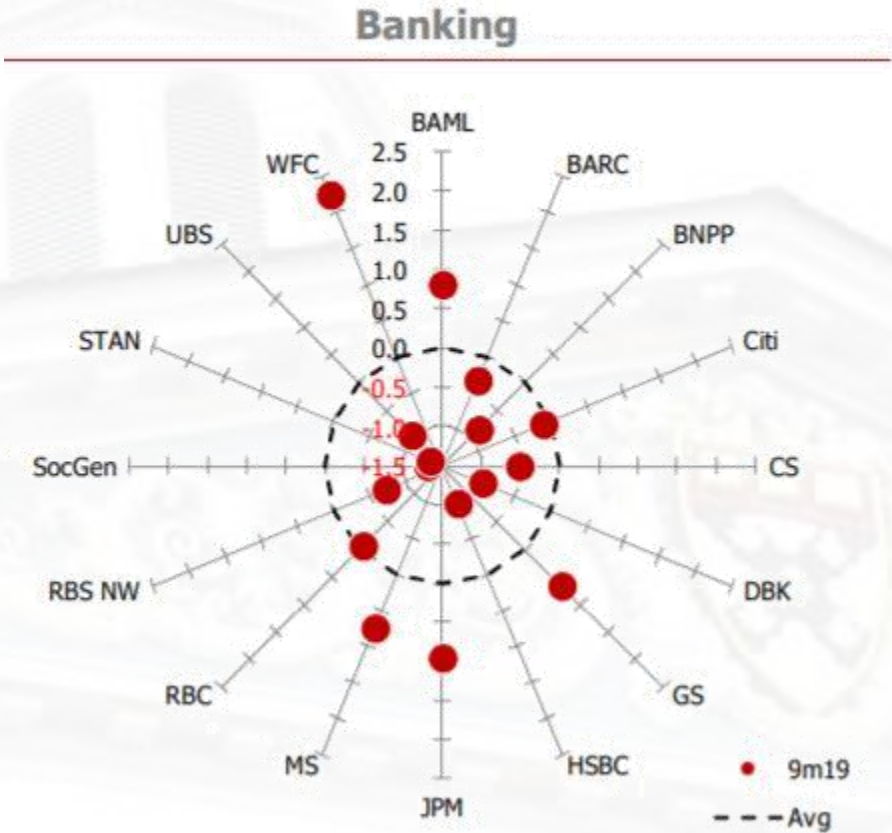
Return on common equity, %



Source: Company filings © FT

The Impending Slowdown

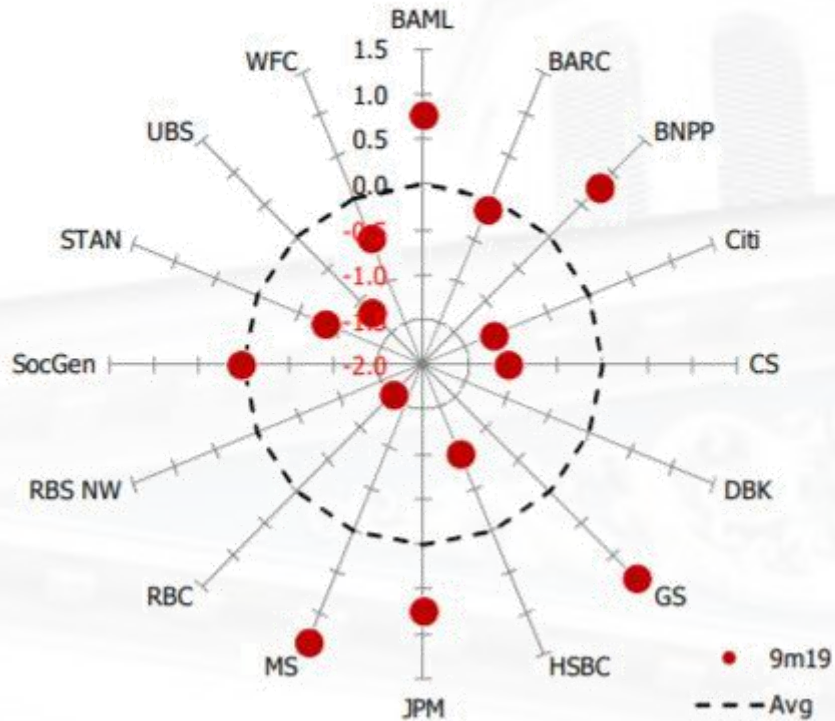
Operating revenues per unit of full time front office headcount (IBD) YTD Q3 2019



The Impending Slowdown (Cont'd)

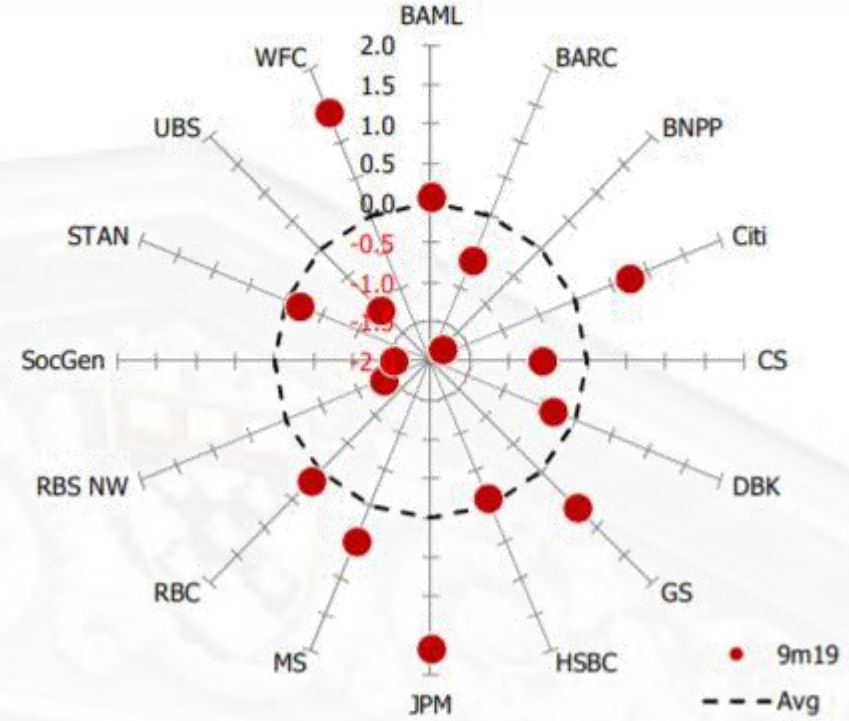
Operating revenues per unit of full time front office headcount (Equities) YTD Q3 2019

Equities



Operating revenues per unit of full time front office headcount (FICC) YTD Q3 2019

FICC





**Robotic Process Automation
机器人与工序自动化**

Full-stack AI-enabled Robotic Process Automation (RPA) solution suite for business-critical tasks spanning multiple applications and data silos



**Quantum Computing
量子计算**

Solution provider and platform developer for quantum and classical computing for predictive analytics, forecasting, and optimization



**Computer Vision
计算机视觉**

Developer of deep learning technology-based computer vision solutions aimed at a broad range of consumer and enterprise applications



**Knowledge Graph
知识图表**

Dynamically evolving knowledge graphs that provides inference strength across concepts, events and themes derived from a wide variety of information services



**Real-Time Robotics Automation
实时机器人自动化**

Deep reinforcement learning-based AI software platform that enables enhanced perception, reaction and control in real-time robotics environments



**AI Chips
人工智能芯片**

Deep reinforcement learning-based AI software platform that enables enhanced perception, reaction and control in real-time robotics environments



**Cybersecurity
网络安全**

Advanced deep learning technology-based cybersecurity products and solutions for threat detection and prevention



**Music Augmentation
音乐强化**

Developer of a music augmentation technology that transforms linear music to dynamically personalized music for consumers, ad-agencies, music labels, and producers

QxBranch builds software and applications for quantum computers

We help organizations prepare for the future of data analytics with insightful and quality-engineered quantum computing applications.

Quantum computing and data analytics

Quantum Computing is an emerging technology that leverages the unique behavior of quantum physics to perform computations. This new approach enables efficient solutions to complex, large-scale problems in data analytics, including some practically impossible on classical computers.

QxBranch is building machine learning and optimization applications that create the highest value for enterprises when used on near-term quantum computers.

The right tools for decision-making in a complex, dynamic and uncertain world

[find out more](#)



A Random Walk Approach to First-Order Stochastic Convex Optimization

July 7 - 12 2019 ISIT, Paris, France

Authors: Sattar Vakili and Qing Zhao (Cornell University)

Abstract: An active search strategy based on devising a biased random walk on an infinite-depth tree constructed through successive partitioning of the search domain is developed. By localizing data processing to small subsets of the input domain based on the tree structure, it enjoys very low computation and memory complexity and allows dynamic allocation of limited data storage.

Multi-agent Systems



Partial Verification as a Substitute for Money

January 27 - February 1 2019 AAAI, Honolulu, Hawaii, USA

Authors: Sofia Ceppi, Ian Kash (University of Illinois at Chicago) and Rafael Frongillo (University of Colorado Boulder)

Abstract: Recent work shows that we can use partial verification instead of money to implement truthful mechanisms. In this paper we develop tools to answer the following question. Given an allocation rule that can be made truthful with payments, what is the minimal verification needed to make it truthful without them? Our techniques leverage the geometric relationship between the type space and the set of possible allocations.

Multi-agent Systems

Mechanism Design

Partial Verification



Search

Quick links

AAAI

Abstraction

ATARI Domain

Autonomous Formal Verification Methods

Bayesian Optimisation

Bounded-Rationality

Data Efficiency

Deep Learning

Differential Evolution

Distributed Optimisation

Game Theory

Gaussian Processes

Graph Theory

High-Dimensional Representation

Information Theory

Learning to Learn

Lifelong Learning

Model Learning

Multitask Learning

Network Flow

NeurIPS

Non-Stationary Environments

Non-Convexity

Online Learning

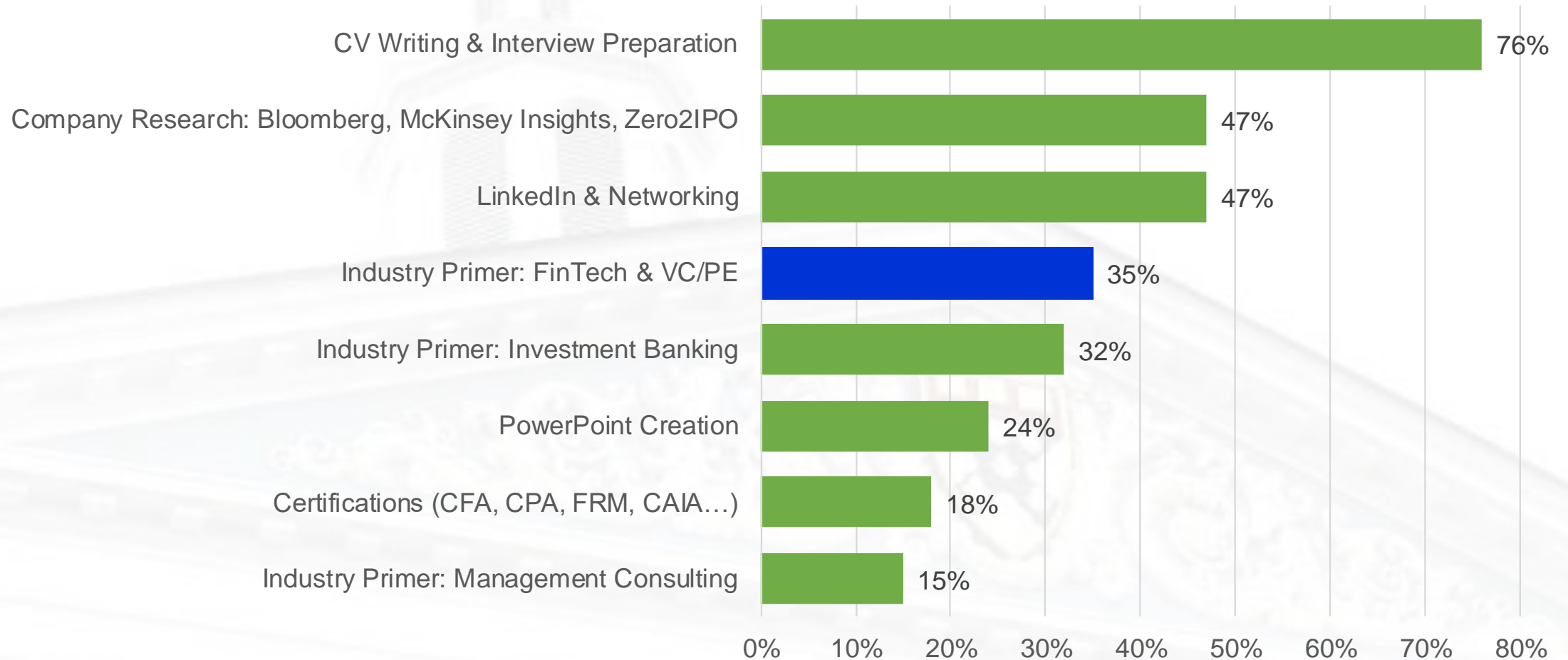
Optimisation

Repeated Games

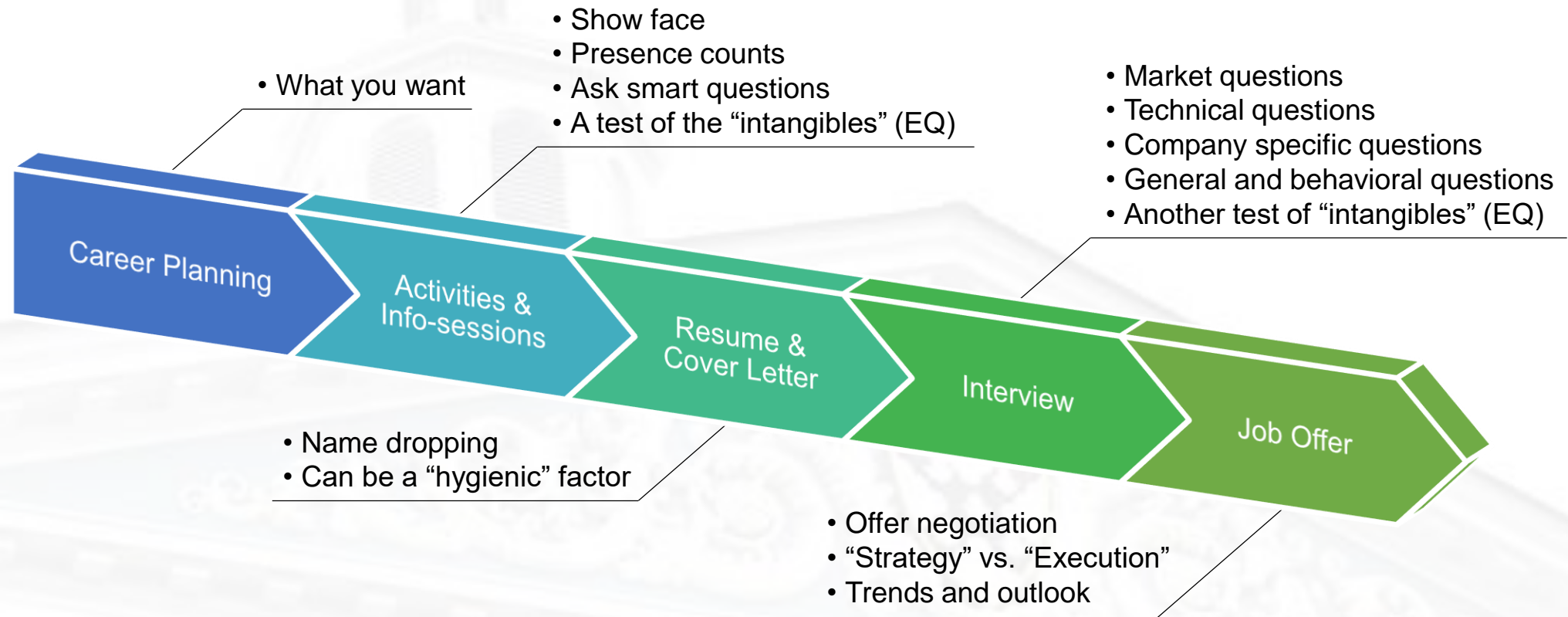
Software Engineering

Beyond the Classroom

Topics of Interest
(n = 34)



Career Roadmap & CV Clinic



Industry Resources

Publisher	Report	Language
Boston Consulting Group	Impact of Coronavirus on the Economy (新冠病毒對經濟的影響)	Chinese
Industrial Bank of China, Mentor X	White Paper on Career Development of Chinese Students in the United States 2019 (2019中國留學生就業白皮書)	Chinese
Deloitte	2020 Global Banking and Capital Markets Outlook (2020年全球銀行業和資本市場展望)	Chinese
WeBank	WeCross Technical Whitepaper (WeCross技術白皮書)	Chinese
White Star Capital	SEA Venture Capital Landscape 2020	English
PitchBook	2019 Annual Global League Tables	English
BlackRock	2020 Global Investment Outlook	Chinese
Hurun Report	2019 China AI Industry IP Development Whitepaper (2019中國人工智慧產業知識產權發展白皮書)	Chinese
Clifford Chance	FinTech in 2020: Five Trends to Watch	English
J.P. Morgan	Ten Questions about China in 2020	English
CMB International	Global Economic Outlook (全球經濟展望)	Chinese
United Nations	World Economic Situation Prospects 2020	English

Industry Resources (Cont'd)

Publisher	Report	Language
Blackchain Consulting	Blockchain in Real Estate	English
ifenxi	Implementation & Outlook: How AI Create Value for the Financial Industry (中國智慧金融報告: AI如何為金融業創造價值)	Chinese
Credit Suisse	Global Equity Strategy: 2020 Research Outlook: Themes, Sectors and Styles	English
McKinsey	McKinsey Global Banking Annual Review 2019: The last pit stop? Time for bold late-cycle moves	English
Roland Berger	Foresight 2020: China Industry Trends Report (預見2020: 羅蘭貝格中國行業趨勢報告)	Chinese
Chinese Academy of Sciences	2019 AI Development Whitepaper (2019年人工智慧發展白皮書)	Chinese
PitchBook, NVCA	Venture Monitor Q4 2019	English
Chinese Academy of Social Sciences	Blue Book of China's Economy: Economy of China Analysis and Forecast (2020)	Chinese
Alibaba Damo Academy	2020 Top 10 Technology Trends	Chinese
Tsinghua University	2019 Report of Artificial Intelligence Development	Chinese
UBS	Global Economics & Markets Outlook 2020-2021	English

Investment Banking Essentials

Academics



GPA

Classes

Exchange

Internships

Goldman Sachs

Morgan Stanley

J.P.Morgan



Technicals

- Financial Statement Analysis
- Macroeconomics
- Valuation
- Corporate Finance
- Financial Mathematics

Aug 2011 – May 2013	MORGAN STANLEY ASIA Associate, Investment Banking Division – Hong Kong Corporate Finance Coverage Team	HONG KONG, CHINA
	<ul style="list-style-type: none"> • Shangri-La Asia inaugural issuance of US\$600MM under US\$3Bn Medium Term Note Program • Multiple senior unsecured bond offerings for Hong Kong corporates, such as Kerry Properties (US\$600MM), Hang Lung Properties (US\$500MM), Nan Fung (US\$300MM), and PCCW (US\$500MM) 	
Summer 2010	Summer Associate, Investment Banking Division – Technology, Media & Telecommunications Group	
	<ul style="list-style-type: none"> • US\$272MM IPO of Dangdang Inc., China’s largest B2C e-commerce company (equivalent of Amazon) 	
2006 – 2009	J.P. MORGAN CHASE & CO.	
2008 – 2009	Investment Strategy Analyst, J.P. Morgan Private Wealth Management	NEW YORK, NY
	<ul style="list-style-type: none"> • Sole analyst directly supporting the global Chief Investment Officer (CIO) and Chief Economist of PWM 	
2006 – 2008	Financial Analyst, J.P. Morgan Private Bank	SAN FRANCISCO, CA
Summer 2007	Financial Analyst, J.P. Morgan Private Bank, EMEA Equity Derivatives Group	LONDON, UK
Education		
2015 – 2016	UNIVERSITY OF HONG KONG Master of Science in Information Technology in Education (Specialist Strand: e-Leadership), <i>Distinction</i> .	HONG KONG, CHINA
2009 – 2011	HARVARD BUSINESS SCHOOL MBA. Co-producer, Asian Cultural Show. Advisor, Harvard Innovation Lab (iLab)	BOSTON, MA
2002 – 2006	UNIVERSITY OF CALIFORNIA, BERKELEY – HAAS SCHOOL OF BUSINESS BERKELEY, CA Bachelor of Science in Business Administration, <i>summa cum laude</i> (cumulative GPA: 3.9, top 3% of class). Dean’s Honor List (02-06). President, California Investment Association (Haas-sponsored investment fund)	
Technology- related Certifications	<p>Certificate on Machine Learning for Big Data & Text Processing at MIT Computer Science and Artificial Intelligence Laboratory (CSAIL). Certificate on Deep Learning and Machine Learning with TensorFlow. Certified Bitcoin Professional (CBP). Conducted research into Probabilistic Topic Modeling using R</p>	

Info-session & Activities

- Types: coffee chats, presentations, campus visits, company visits, speaker events, dinners, drinks
- Face-time important
- “Paper-time” (i.e. signing in) equally important
- Learn the jargon**
- Key is to show up, show face, and **not screw up**
- Problem of competing with peers