Artificial Intelligence in Finance

at

Hong Kong University of Science and Technology

Virtual Banks in Hong Kong

A "virtual bank" refers to a bank which delivers retail banking services primarily, if not entirely, through the internet or other forms of electronic channels instead of physical branches.

December 2014

Tencent Holdings leads partners to set up Shenzhen-based WeBank with registered capital of three billion yuan. It is the largest shareholder with a 30 per cent stake. The bank's target customers include individuals and small and micro enterprises



June 2015

Alibaba Group Holding leads partners to establish Zhejiang E-Commerce Bank, or known as MYbank, as the largest shareholder with a 30 per cent stake. With four billion yuan in registered capital, the Hangzhou-based banking venture targets small and micro enterprises, the rural market and smaller financial institutions



June 2016

Xiaomi wins the approval from the China Banking Regulatory Commission to set up XW Bank with three billion yuan in registered capital. It holds a 29.5 per cent stake in the Chengdu-based lender as the second-largest shareholder while New Hope Group holds 30 per cent as the largest shareholder



December 2016

Suning Commerce Group secures the approval from the regulator to set up Suning Bank as the largest shareholder with a 30 per cent stake. The Nanjing-based bank has four billion yuan in planned registered capital



January 2017

Baidu obtains regulatory approval for Baixin Bank, a direct bank without any brick-and-mortar branches. China Citic Bank Corp holds 70 per cent of the Beijing-based lender and Baidu holds the remainder



SCMP

Source: China Banking Regulatory Commission, banks' websites, SCMP research

China's virtual banks. Source: China Banking Regulatory Commission. SCMP Graphics

Virtual Banks in Hong Kong: Announcement

- The HKMA has announced that as part of the package of initiatives it introduced in September 2017 to bring Hong Kong into a new era of smart banking, it will facilitate the establishment of virtual banks in Hong Kong
- On March 27, 2019, HKMA released the first three licenses to:
 - Livi VB, co-owned by Bank of China (Hong Kong), JD Digits and Jardines
 - SC Digital Solutions, a joint venture between Standard Chartered, HKT, PCCW and Ctrip
 - 3. Zhong An Virtual Finance, a joint venture between ZhongAn Online and Sinolink

Virtual Banks in Hong Kong: Impact

- Increasing competition (virtual vs. traditional) HK becomes one of the most heavily saturated for banking services globally
 - ➤SCB, HSBC, BOC(HK): 66% of lending market, 77% of mortgage market, 76% credit card market, 50% of deposit market → decrease
 - ➤ But traditional banks already have online banking services which have similar functions to virtual banks
- Bringing new models and experience to the banking sector Many non-banking companies will join the sector, e.g. WeLab
- Cross-border (regionally and internationally)
- Transparency
- Jobs market will be different (traditional VS new)

Virtual Banks in Hong Kong: Challenges

- Hard to gain trust from customers for new entrants (young vs. elderly)
- Competition with traditional bank's digital services
- Regulation probably even tougher (especially Cyber Crimes)
- Technology development and risk management
- Enormous demand from non-bank financial actors from Mainland China, but requirement of HK\$ 300m is still very high, i.e. Big Boys' Game

| | | | Course Schedule | |
|---------|--------|--|---|---|
| Session | Date | Topic | Application & Case Study | In-Class Activity |
| 1 | Feb 1 | History and Overview of Artificial Intelligence | Google Experiments: Draw! | Kahoot |
| 2 | Feb 15 | Supervised & Unsupervised LearningClassification vs. Regression | Google Experiments: Vision Sensing Case study: HireVue (Video Analytics for Recruitment) | Class survey and group formationKahoot |
| 3 | Feb 22 | Regression & ClassificationModel Assessment and Selection | Speaker: Katrina Fong | Kahoot |
| 4 | Mar 1 | Decision Tree & Random ForestsBoosting | Credit analysisMock interview by Katrina | Kahoot |
| 5 | Mar 8 | GPU Tutorial | | Kahoot |
| 6 | Mar 15 | - Blockchain | Speaker from VEE Technology LLC | Sharing from researchers and industry professionals |
| 7 | Mar 22 | Neural Network BasicsPerceptrons | Speaker: Mr. Jeffrey Hui | Word2VecKahoot |
| 8 | Mar 29 | Recurrent Neural Network (RNN)LSTM | Google Image RecognitionCase study: SenseTime (Computer Vision) | 3D Visualization of CNNKahoot |
| 9 | Apr 12 | Reinforcement Learning | Case study: Osaro (Robotics), Ascent (Autonomous Driving) | Kahoot |
| 10 | Apr 26 | – GAN | | – TBA |
| 11 | May 3 | TensorFlow Implementation | Recap of conceptsCase studies: Airobotics (Drones), Cornami (Al Chip) | Kahoot |
| 12 | May 10 | Frontiers of AIChallenges in AI Commercialization | Recap of concepts Case studies: Prophesee (Computer Vision), Prowler (AGI) Speaker: Mr. Christopher Lee | Review of Neural Ordinary Differential Equations (NIPS 2018) |
| 13 | May 17 | Synthesis & Outlook | | Final presentations (details TBD) |

Note: Details may change depending on class progress, development of relevant technologies, as well as information and feedback from students' surveys.

The Honor Roll: Analytics



Di! Student Card

For a detailed proposal with techniques such as Laplace smoothing, PCA



Orange

For devising 19 solutions to track and monitor private companies



HappyAlmen

For finding 14 ways with solid rationale underlying each approach

The Honor Roll: Correspondence



Di! Student Card

For being inclusive with proper language



Gesha

For being inclusive with proper language



HAWK

For being inclusive



Orange

For being inclusive with proper language



Pharaoh

For being inclusive



Skyfall

For being inclusive with proper language



Sweetie

For being inclusive with proper language

From: Team Leader E-mail

Subject: Option B - Assignment I - Project X

To: Instructor E-mail

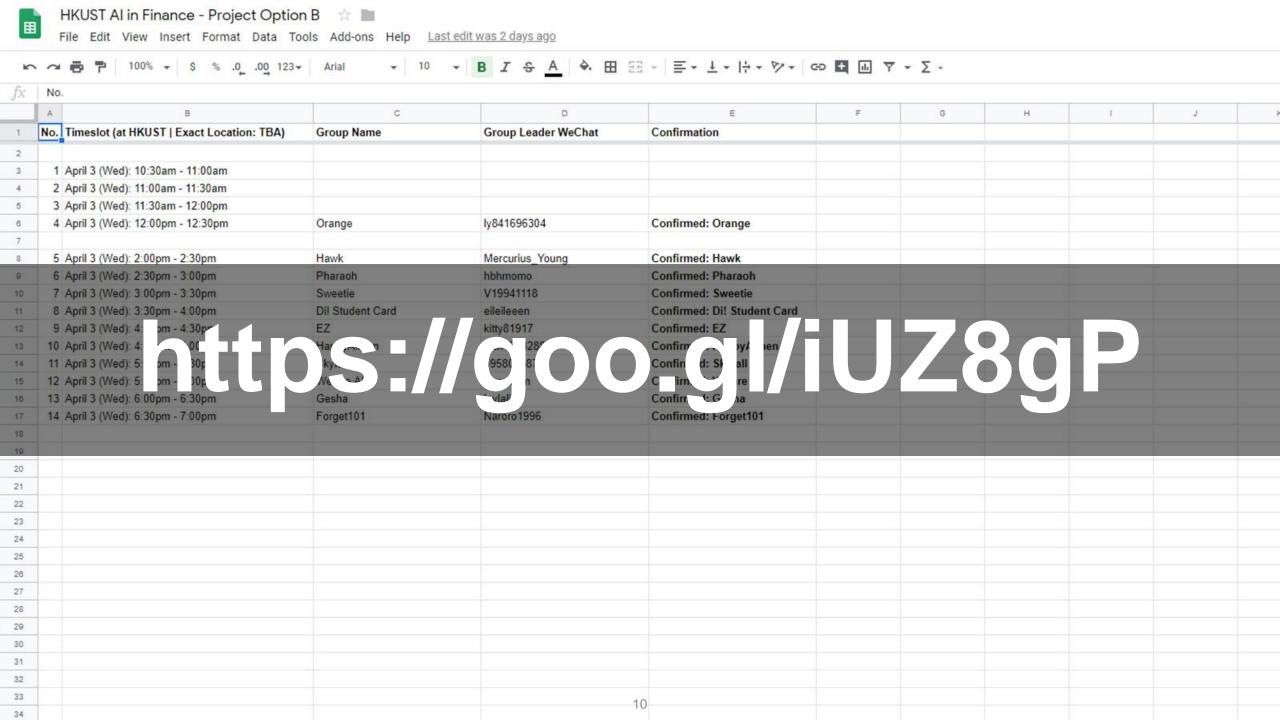
Cc: Team Member 1, Team Member 2, Team Member 3...

Dear Anthony,

Attached please find our assignment I.

Let us know if you have any questions. Thank you.

Best, Team Leader Name



Consultative Session Protocol

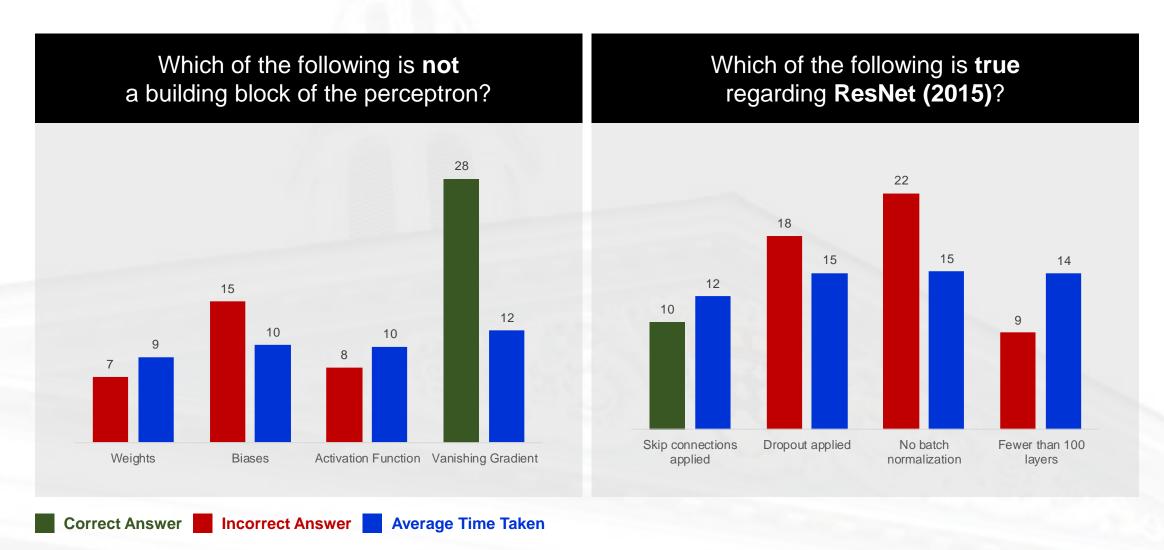
- 1. Leader report on current status
- 2. Key questions and issues
- 3. Brief report from each team member
- 4. Direct Q&A with each team member
- 5. Next steps and future direction

Consultative Session: Tips & Best Practices

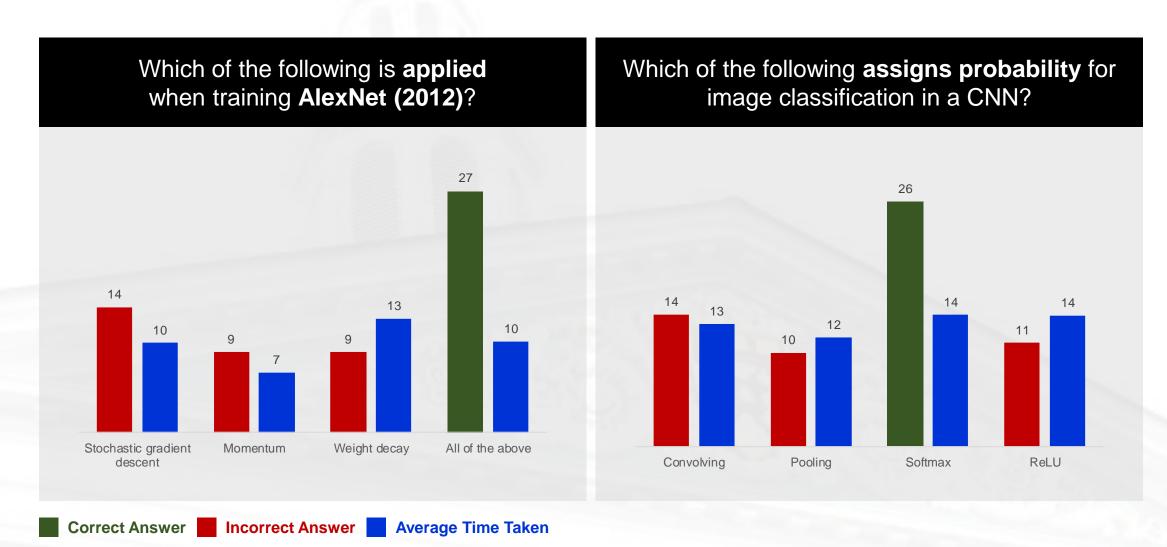
- Because it is a company internship, you are held accountable to corporate standards (US standards, to be specific)
- Not mandatory, but "highly recommended"
 - Same for company meetings, which range from "DS Co. Daily Update" to "Alibaba Annual Meeting"
- If you cannot attend, ask your teammates to talk on your behalf
- Be concise, clear, and straight-forward.
 Talking more does not mean a better result

- There may be team members who are not very eloquent or articulative, you get points for helping each other. In fact, you both get points, so it is a "win-win"
- It is a dialogue and a discussion. No one knows what the "true" answer is, so having some sense of the right direction matters more than what is right vs. wrong
- There will be more of these sessions, so stay tuned

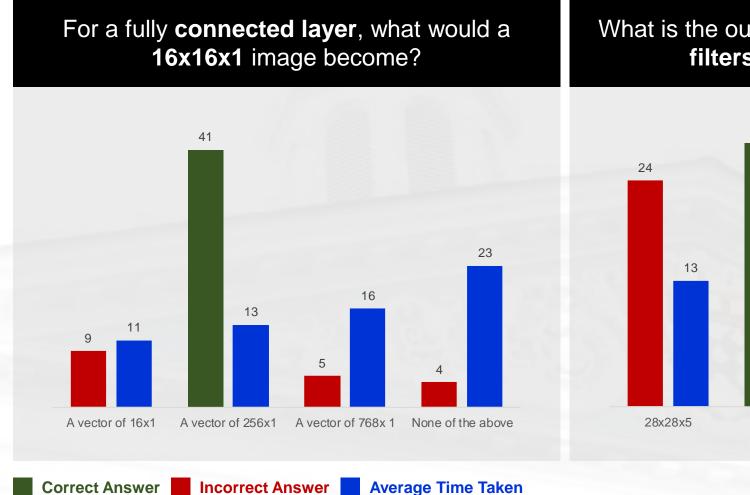
Kahoot! Hiatus



Kahoot! Hiatus (Cont'd)



Kahoot! Hiatus (Cont'd)



What is the output after convolving six (6) 5x5 filters on a 32x32x3 image?

