

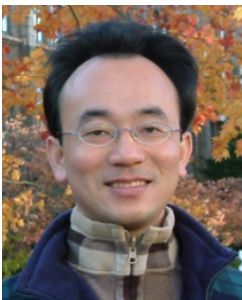
AI Humanoid Conversational Robo-Advisor

Time: 10:30-12:00, 2019/5/6 (Monday)

Place: A205, Engineering Building 5, NCU

Host: Prof. Chia-Hui Chang,

Department of Computer Science and Engineering, National Central University



Min-Yuh Day

Assistant Professor

**Dept. of Information Management,
Tamkang University**

<http://mail.tku.edu.tw/myday/>

2019-05-06





Min-Yuh Day, Ph.D.

Assistant Professor, Information Management, TKU

Visiting Scholar, IIS, Academia Sinica

Ph.D., Information Management, NTU

Publications Co-Chairs, IEEE/ACM International Conference on
Advances in Social Networks Analysis and Mining (ASONAM 2013-)

Program Co-Chair, IEEE International Workshop on
Empirical Methods for Recognizing Inference in Text (IEEE EM-RITE 2012-)

Workshop Chair, The IEEE International Conference on
Information Reuse and Integration (IEEE IRI)



Outline

- **AI Robo-Advisor in FinTech**
- **Conversational Commerce**
- **AI Humanoid Robo-Advisor**

AI Robo-Advisor in FinTech

AIWISFIN

AI Conversational Robo-Advisor (人工智慧對話式理財機器人)

First Place, InnoServe Awards 2018



<https://www.youtube.com/watch?v=sEhmyoTXmGk>

2018 The 23th International ICT Innovative Services Awards (InnoServe Awards 2018)



- Annual ICT application competition held for university and college students
- The largest and the most significant contest in Taiwan.
- More than **ten thousand teachers and students** from over **one hundred universities and colleges** have participated in the Contest.

2018 International ICT Innovative Services Awards (InnoServe Awards 2018)

(2018第23屆大專校院資訊應用服務創新競賽)



第23屆大專校院
2018 資訊應用服務創新競賽
International ICT Innovative Services Awards 2018

創意噴發!

InnoServe Awards

總獎金 > 200 萬

■ 報名日期: 2018/10/2(二)~
2018/10/9(二)pm6 點截止

■ 參賽對象: 大專校院學生、
碩博士生及高中職學生

■ 決賽時間: 2018/11/3(六)
■ 決賽地點: 國立臺灣大學
綜合體育館

☰ 最新消息 ▾

活動訊息

媒體轉載

🌀 競賽緣起

📄 競賽辦法 ▾

👤 競賽報名

💬 活動成果 ▾

🔗 產學媒合 ▾

🔗 媒合

📞 聯絡我們

🗨️ 榮譽榜

屆別 23 ▾ 查詢

第23屆

顯示 30 ▾ 筆資料

表格內全文檢索: AIWISFIN

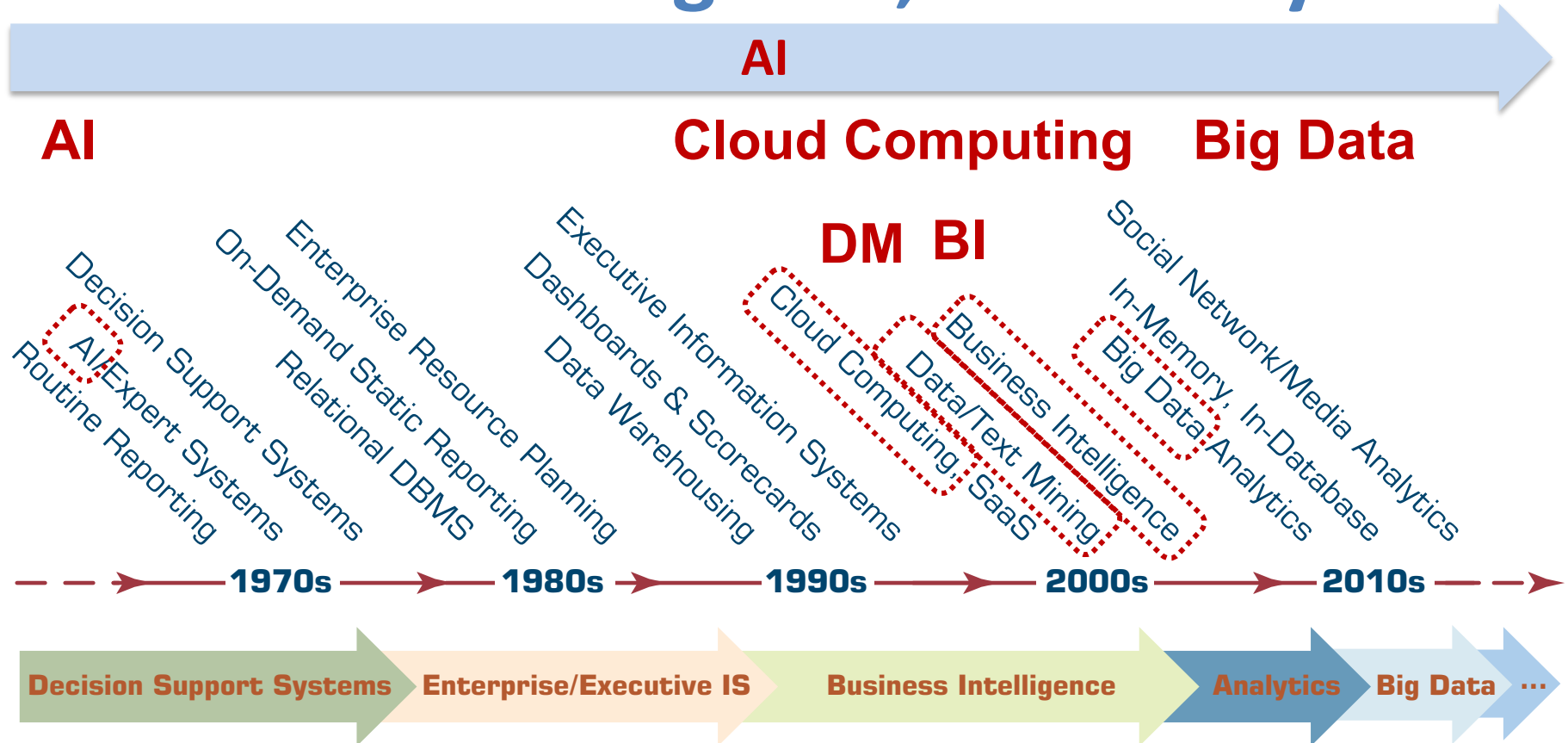
組別	名次	組別編號	學校名稱	專題名稱	指導教授	學生
資訊應用組一	第一名	IP1-06	淡江大學	AIWISFIN 人工智慧對話式理財機器人	戴敏育老師	陳元致、鄧旭廷、王慶宇、邱少文
玉山銀行金融科技趨勢應用組	第一名	E.SUN FINTECH-01	淡江大學	AIWISFIN 人工智慧對話式理財機器人	戴敏育老師	陳元致、鄧旭廷、王慶宇、邱少文

<https://innoserve.tca.org.tw/award.aspx>

Artificial Intelligence (AI)

AI, Big Data, Cloud Computing

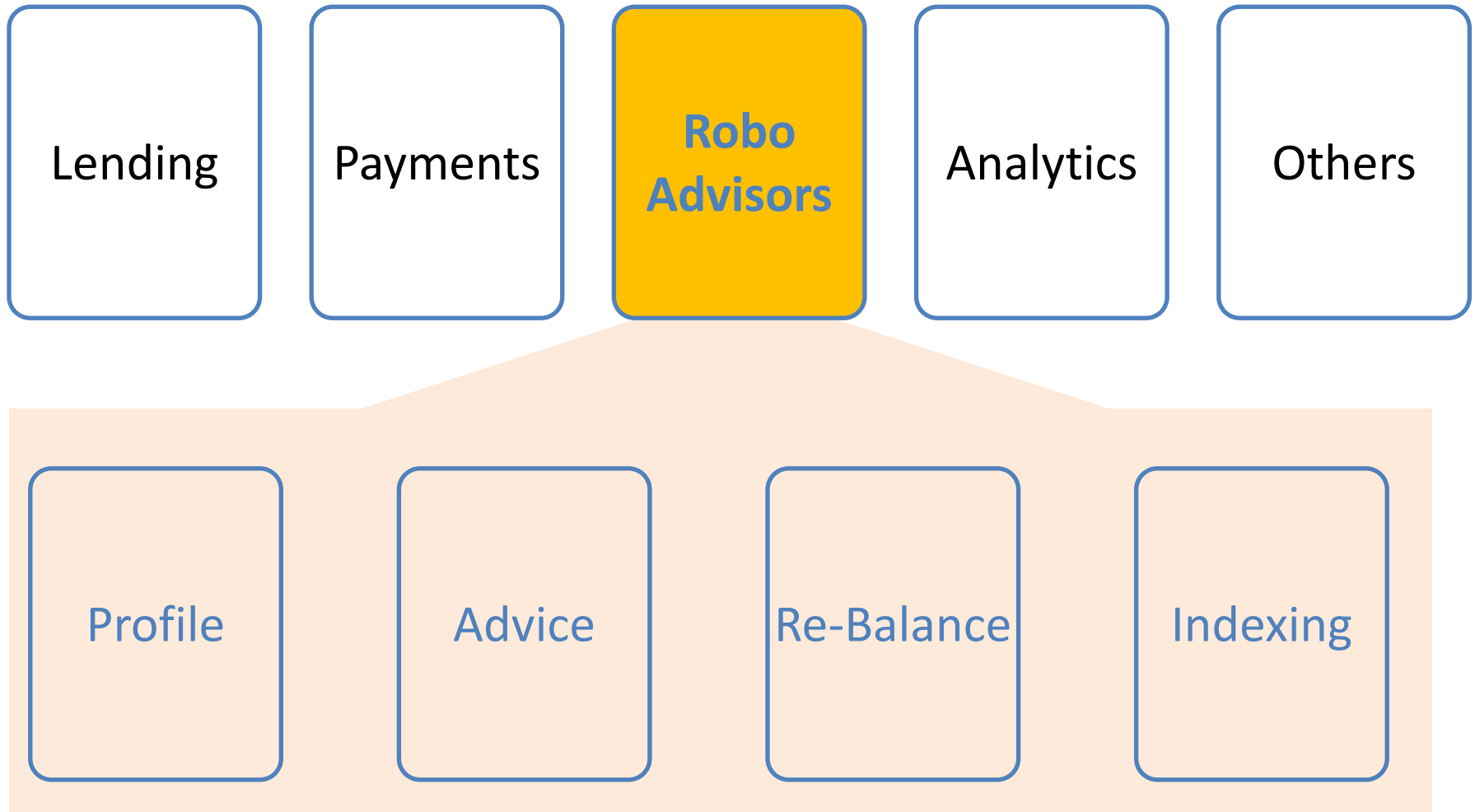
Evolution of Decision Support, Business Intelligence, and Analytics



AI in FinTech

Robo-Advisors

FinTech high-level classification



Wealthfront

Financial Planning & Robo-Investing for Millennials



Plan ▾

Invest

Borrow

Expertise ▾

LOG IN

GET STARTED

WEALTHFRONT

Meet your financial copilot

We'll build a free financial plan for the life you want
and automate your investments at a low cost.

Our all-in-one solution gives you the financial expertise
you need, right in your pocket. No spreadsheets, no
annoying sales calls, no judgment.

GET STARTED



<https://www.wealthfront.com/>

Betterment

Online Financial Advisor

Betterment

Why Betterment

How it works

What we offer

Pricing

FAQs



Log in

Get started

HELLO, INVESTOR

Betterment is an online financial advisor built for people who refuse to settle for average investing. People who demand better. People like you.

Get started

► Watch our video

Right for every type of investor

New investor

I'm new to investing, or am looking for some guidance.

Hands-off investor

I invest, but don't have the time or desire to do it myself.

Hands-on investor

I'm a confident, hands-on investor looking for an optimal solution.

<https://www.betterment.com/>

Financial Advisor FinTech Solutions Map

Financial Advisor FinTech Solutions Map



From Algorithmic Trading to Personal Finance Bots: 41 Startups Bringing AI to Fintech

From Algorithmic Trading To Personal Finance Bots: 41 Startups Bringing AI To Fintech

AI in Fintech

41 Startups Bringing Artificial Intelligence To Fintech

General Purpose/ Predictive Analytics

AYASDI  Digital Reasoning  context relevant™ 
  cortical.io  Numenta 
 DataRobot  nervana
SYSTEMS

Market Research & Sentiment Analysis

 indico  acuity
TRADING  Lucena
Quantitative Analytics  NUMERAI
 Dataminr™

Search Engine

 alphasense

Quantitative Trading

 sentient
technologies  CLONE ALGO
 Alpaca
 WALNUT
ALGORITHMS

Blockchain

 Skry
 EUKLID

Debt Collection

 TrueAccord

AI Assistants/Bots

 KASIST@
 TRIM
 Penny
 INSURIFY
 SURE.
 Cleo  FinGenius

Fraud Detection

 feedzai
 BIOCATCH
Less Friction. Less Fraud.

Credit Scoring

 TypeScore  aire
 creditvidya  zest
finance
 ADF  APPLIED
DATA
FINANCE
 Wecash  网银奇异
 CREAM
FINANCE

Personal Banking

 personetics®
TAKING DIGITAL BANKING PERSONAL
 SBDA
group

Artificial Intelligence (AI) in Fintech

General Purpose/ Predictive Analytics



Market Research & Sentiment Analysis



Search Engine



Artificial Intelligence (AI) in Fintech

Quantitative Trading



AI Assistants/Bots



Credit Scoring



Blockchain



Debt Collection



Fraud Detection



Personal Banking



FinTech

Financial Technology

FinTech

“providing
financial services
by making use of
software and
modern technology”

Financial Services

Financial Services



FinTech: Financial Services Innovation

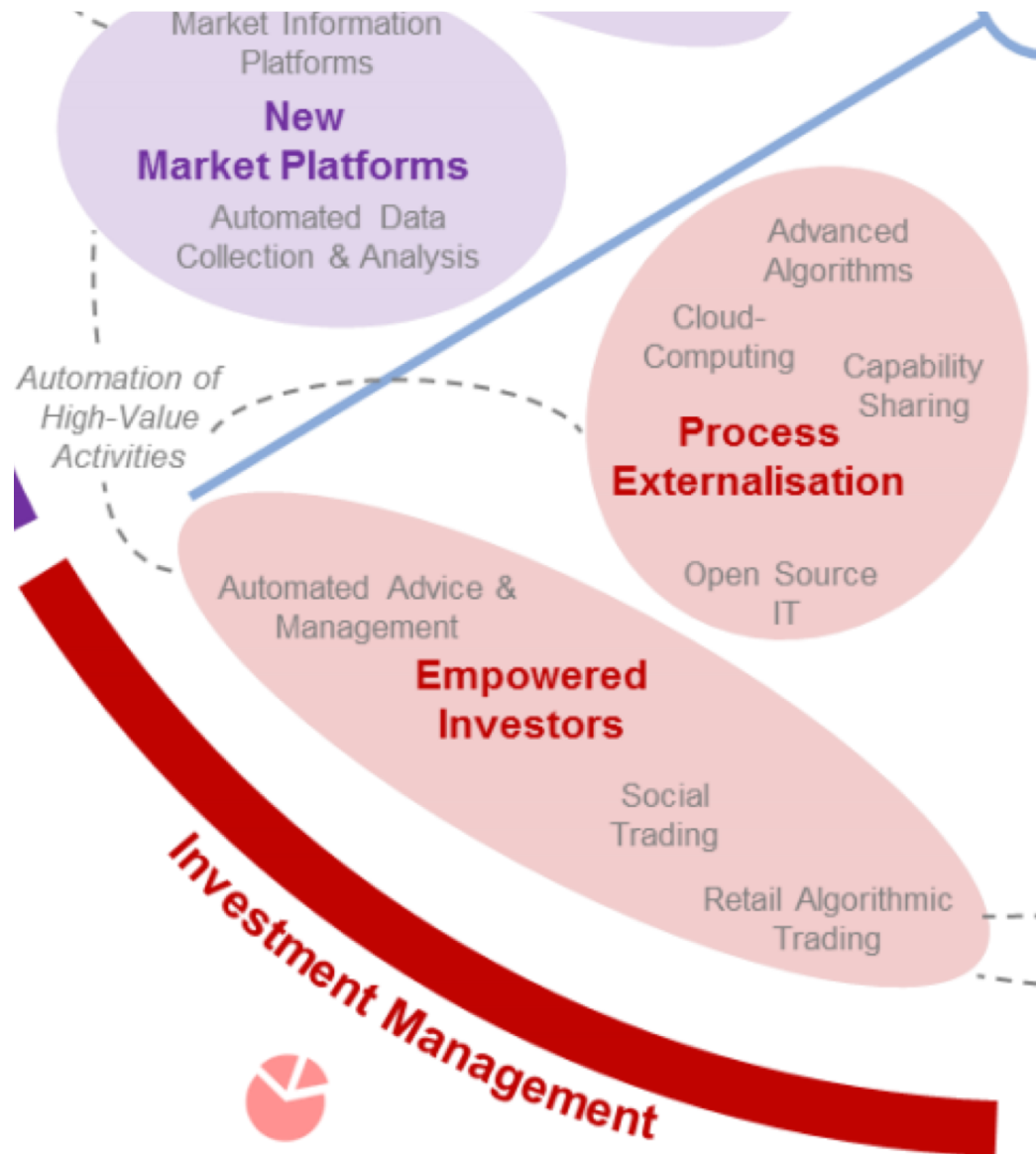


FinTech:

Financial Services Innovation

- 1. Payments**
- 2. Insurance**
- 3. Deposits & Lending**
- 4. Capital Raising**
- 5. Investment Management**
- 6. Market Provisioning**

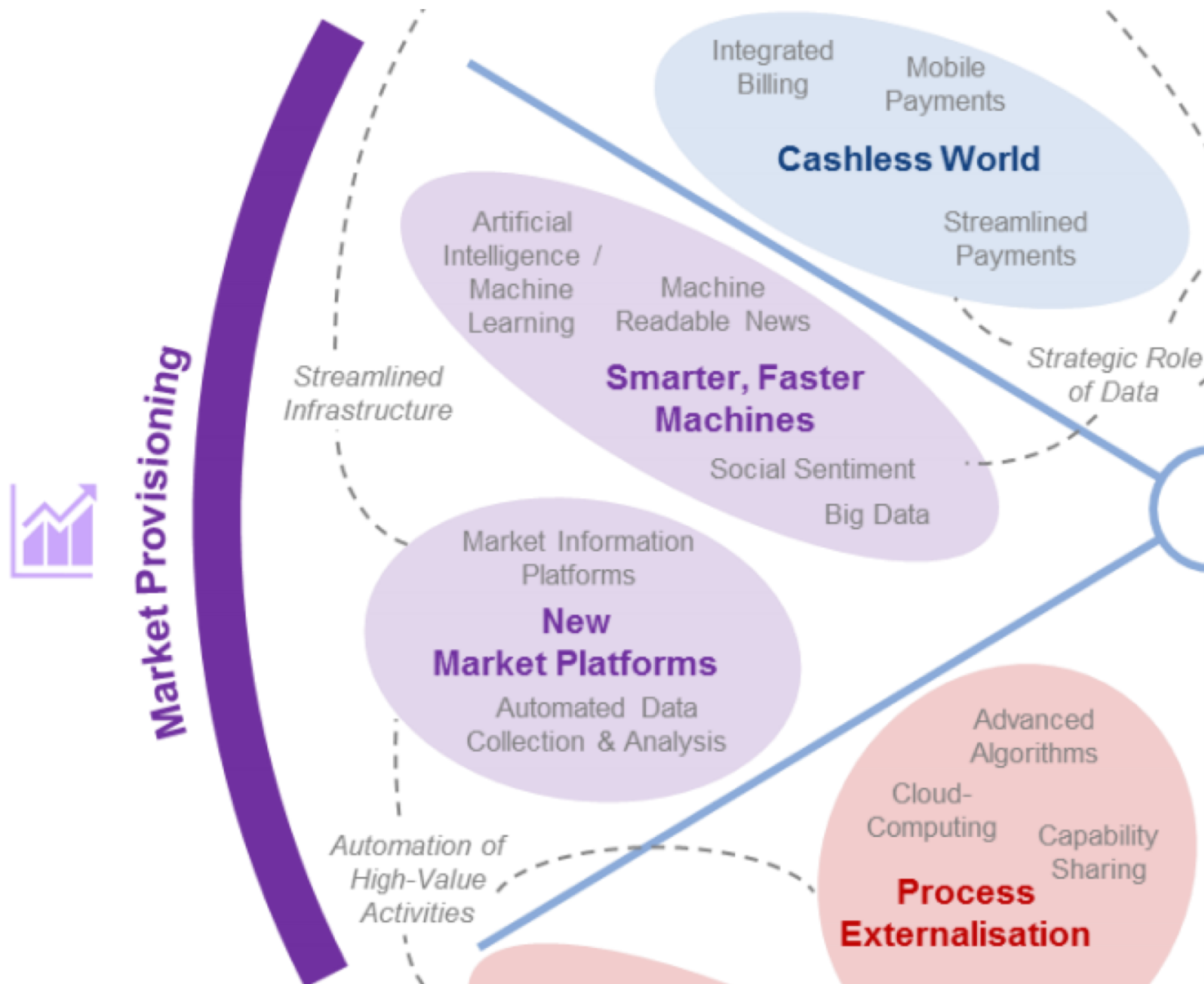
5 FinTech: Investment Management



5 FinTech: Investment Management Empowered Investors Process Externalization

6

FinTech: Market Provisioning



6

FinTech: Market Provisioning Smarter, Faster Machines New Market Platforms

The **New Alpha**: 30+ Startups Providing Alternative Data For Sophisticated Investors

New sources of **data mined** by startups like **Foursquare**, **Premise**, and **Orbital Insight** are letting investors understand **trends** before they happen.

The New Alpha: 30+ Startups Providing Alternative Data For Sophisticated Investors

Alternative Data Sources



Conversational Commerce

AI Chatbot for Conversational Commerce

Chatbots: Evolution of UI/UX

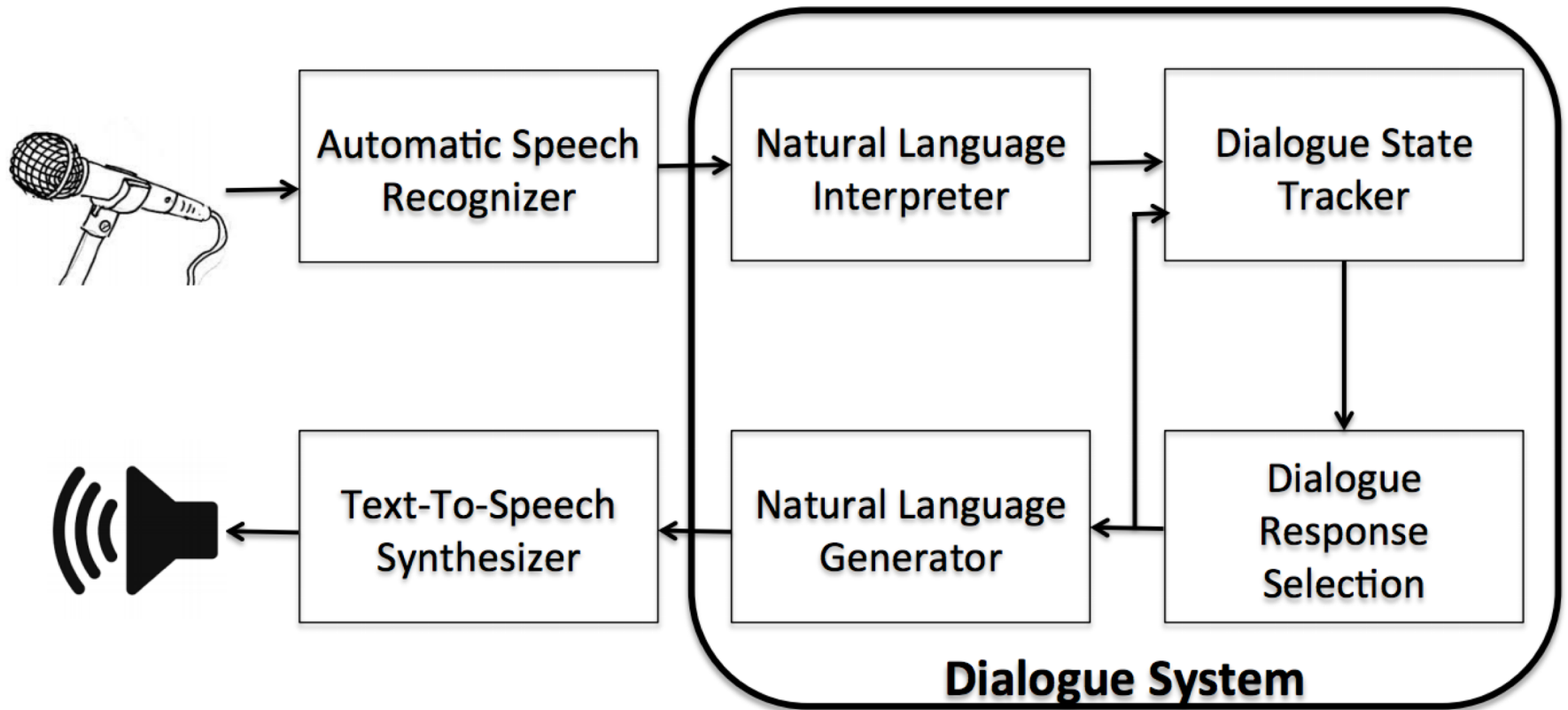
Paradigm	mid - 80s PC	mid - 90s Web	mid - 00s Smartphone	mid - 10s Messaging
Platform	Desktop	Browser	Mobile OS	Messaging Apps
Examples	DOS, Windows, Mac OS	Mosaic, Explorer, Chrome	iOS, Android	WhatsApp, Messenger, Slack
Applications	Clients	Website	Apps	Bots
Examples	Excel, PPT, Lotus	Yahoo, Amazon	Angry Birds, Instagram	Weather, Travel
UI/UX	Native Screens	Web Pages	Native Mobile Screens	Message
S/w Dev	Client-side	Server-side	Client-side	Server-side

Chatbot
Dialogue System
Intelligent Agent

Chatbot



Dialogue System



Can machines think?

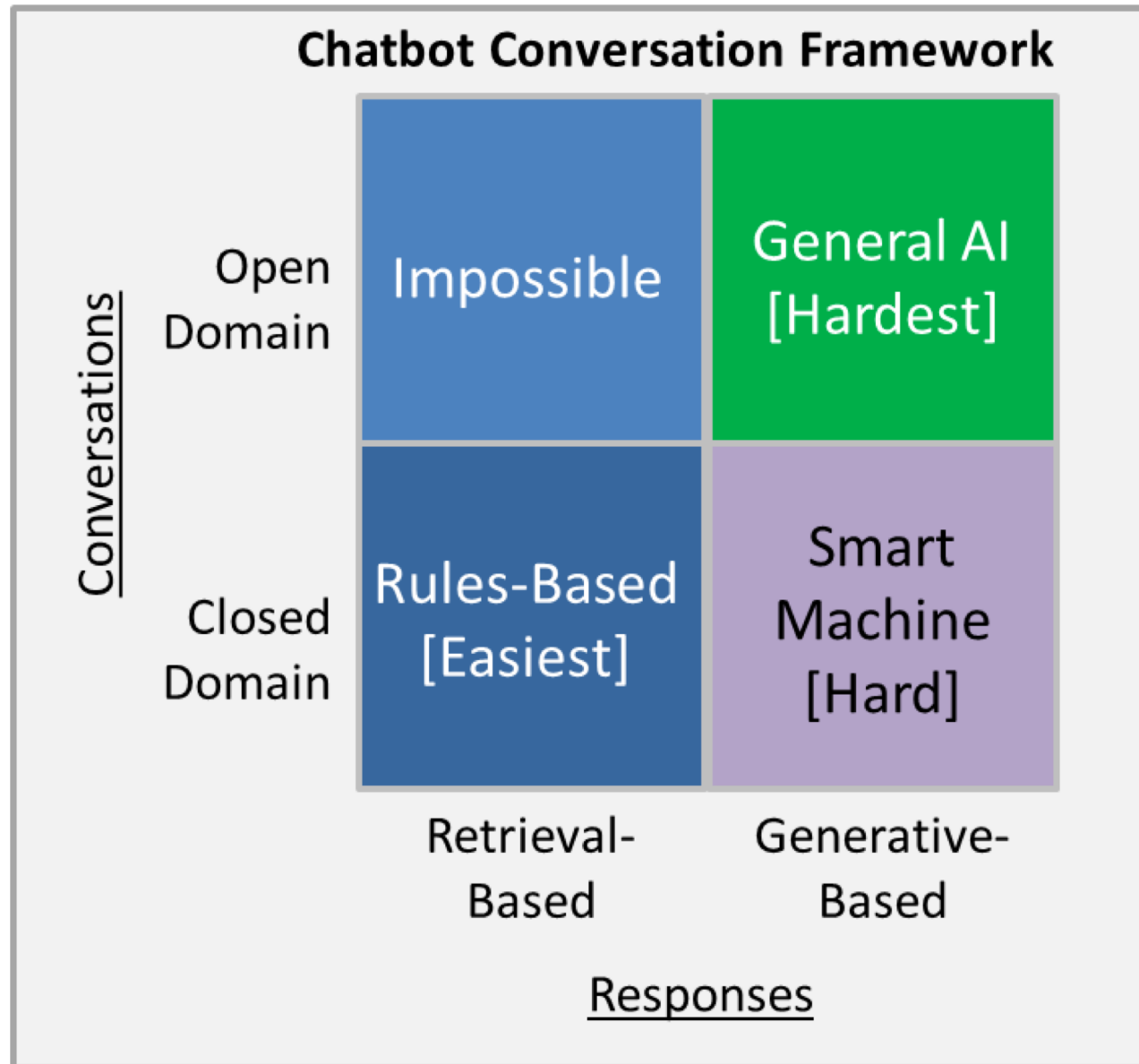
(Alan Turing ,1950)

Source: Cahn, Jack. "CHATBOT: Architecture, Design, & Development."
PhD diss., University of Pennsylvania, 2017.

Chatbot

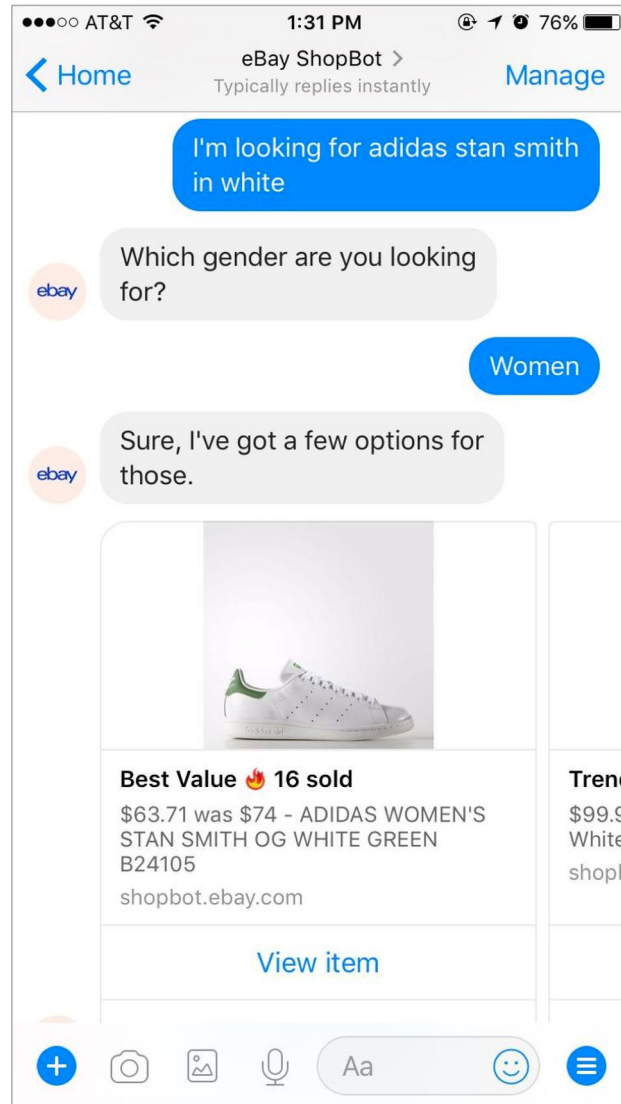
**“online human-computer
dialog system
with
natural language.”**

Chatbot Conversation Framework

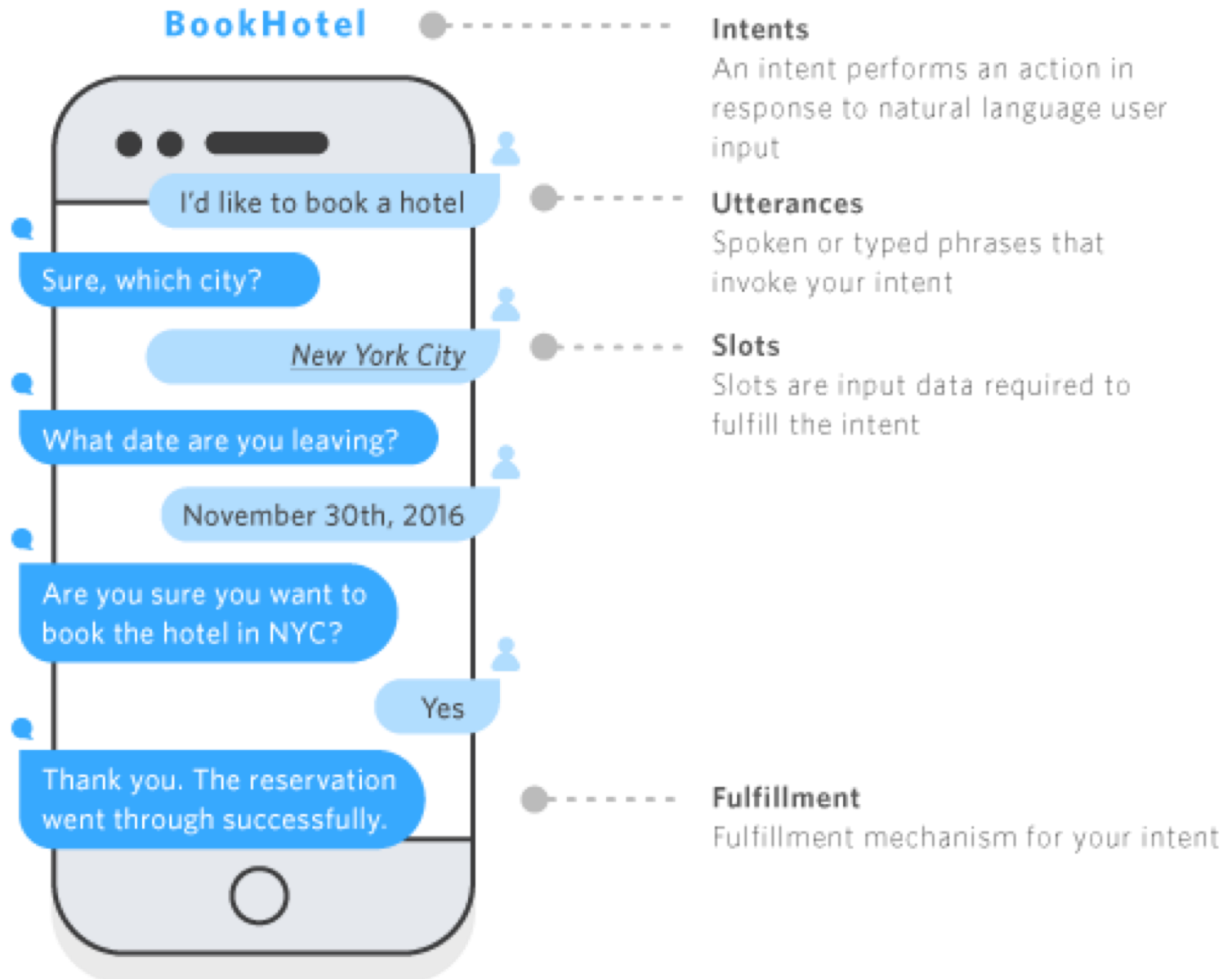


**From
E-Commerce
to
Conversational Commerce:
Chatbots
and
Virtual Assistants**

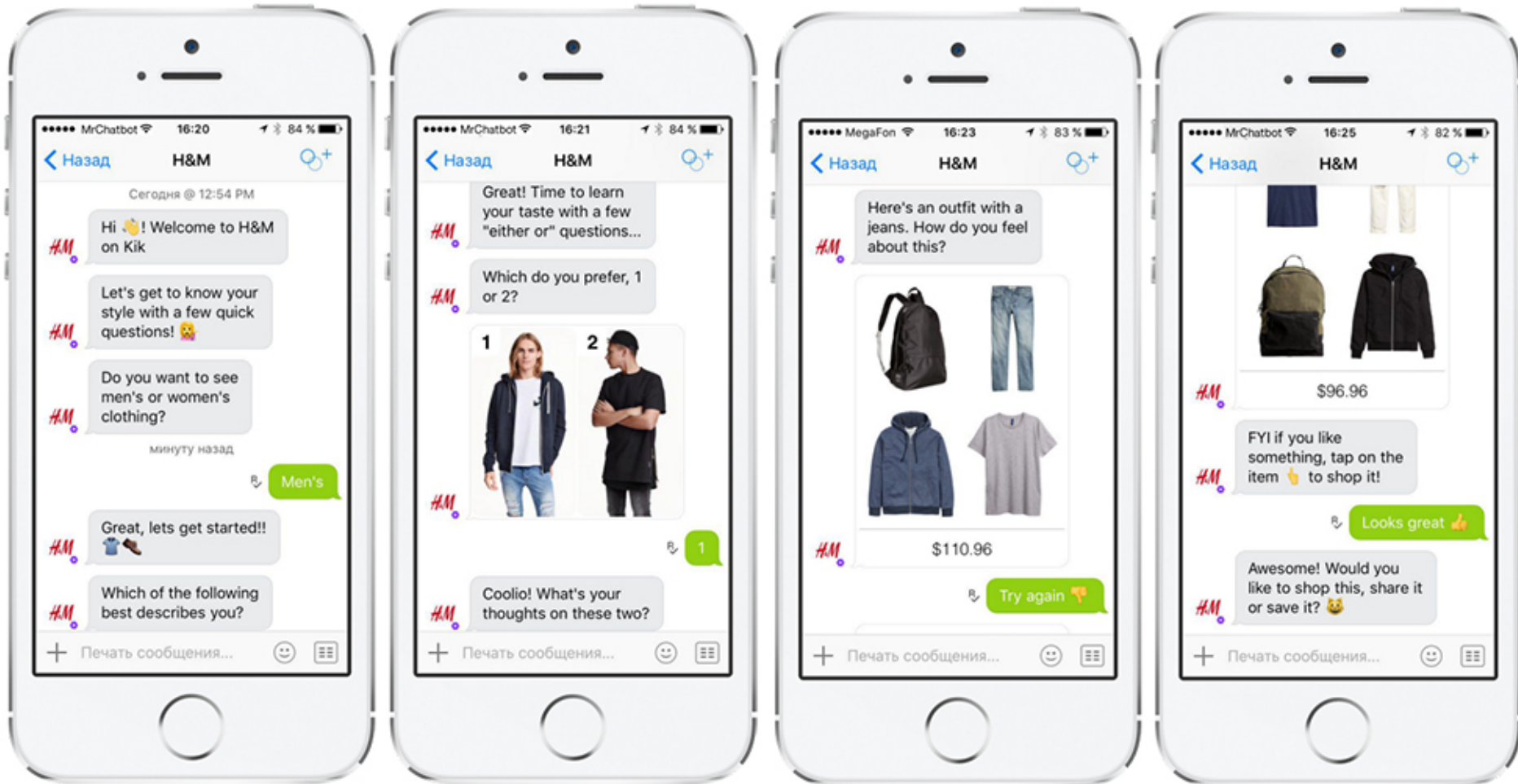
Conversational Commerce: eBay AI Chatbots



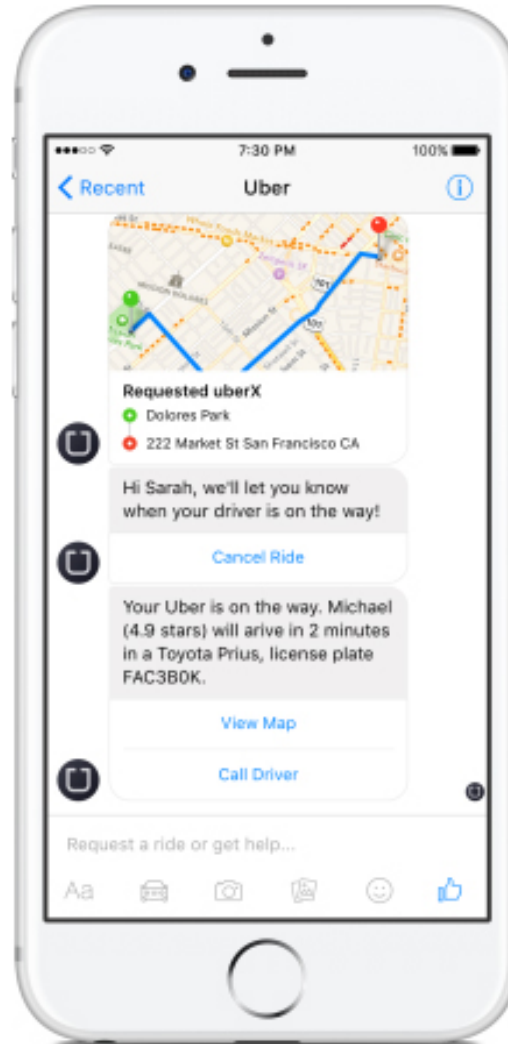
Hotel Chatbot



H&M's Chatbot on Kik



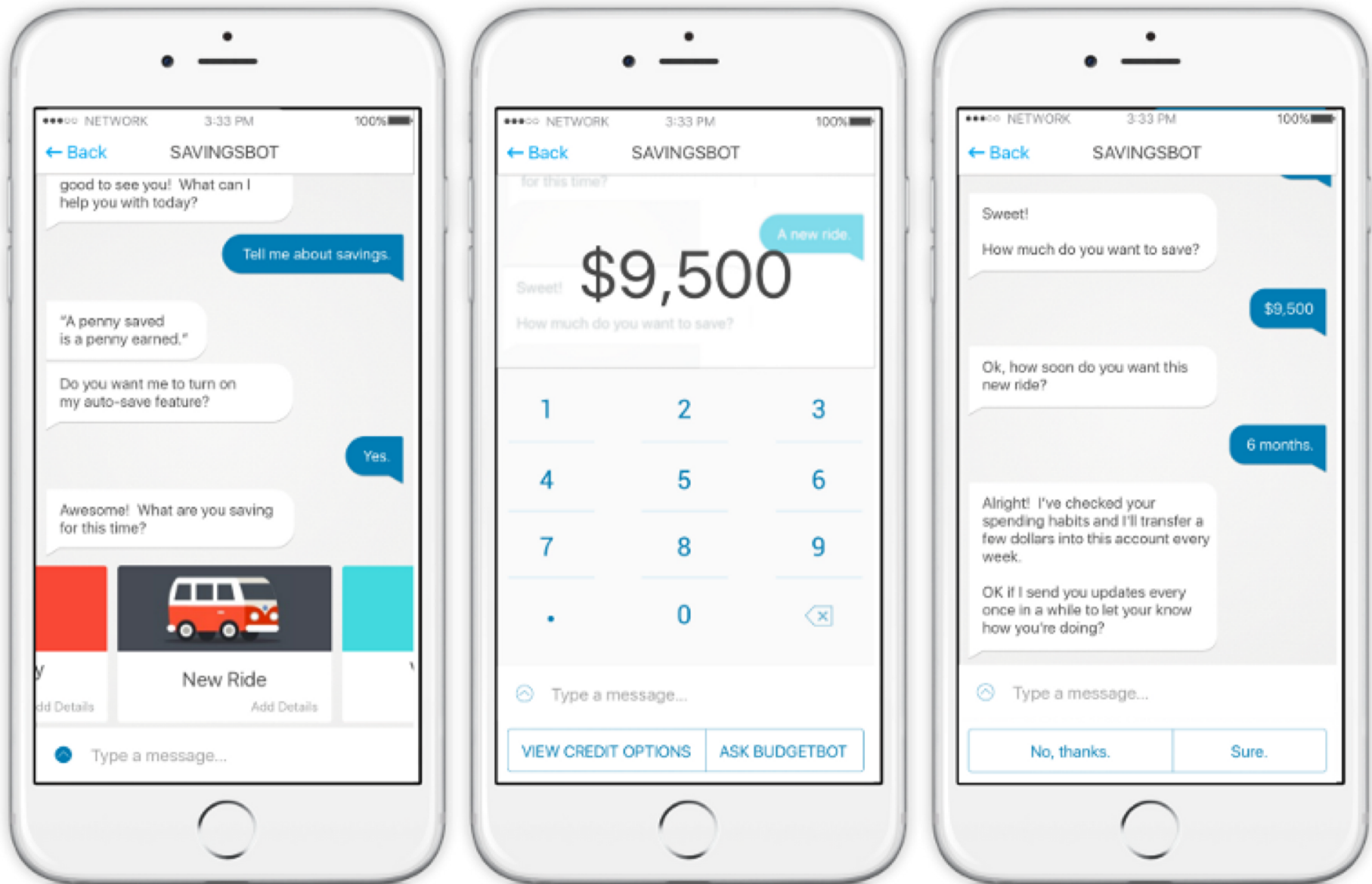
Uber's Chatbot on Facebook's Messenger



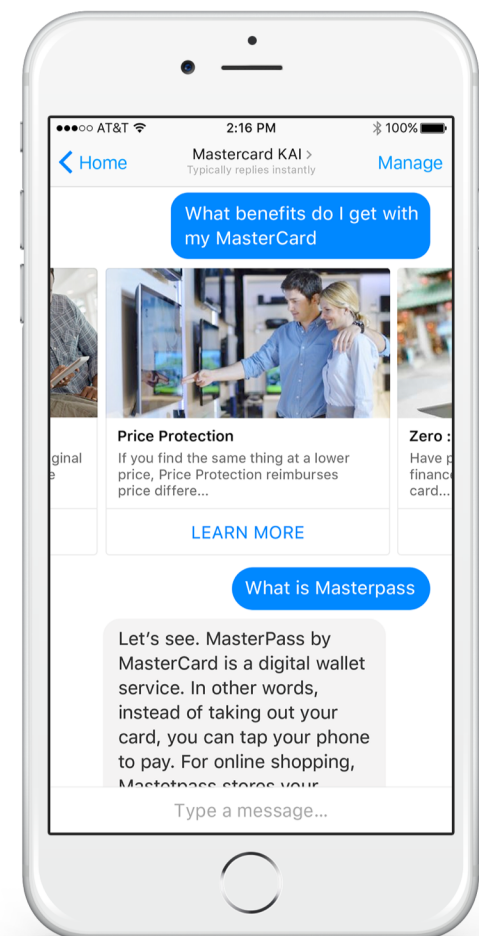
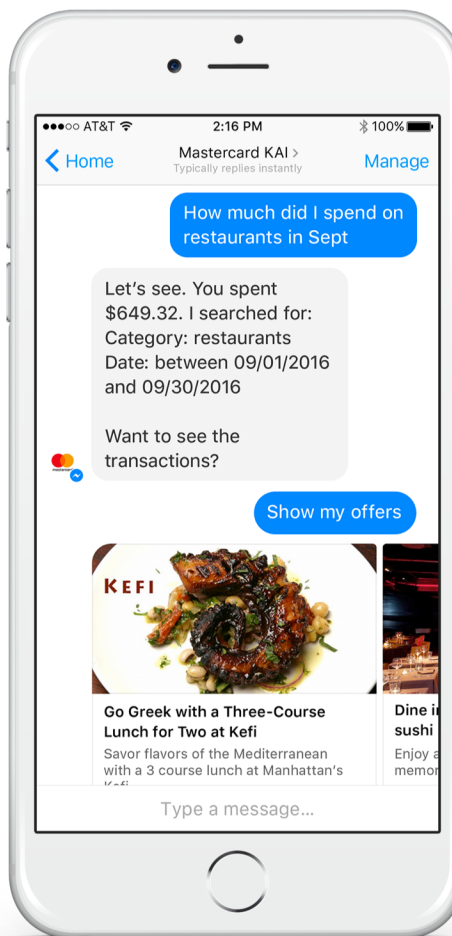
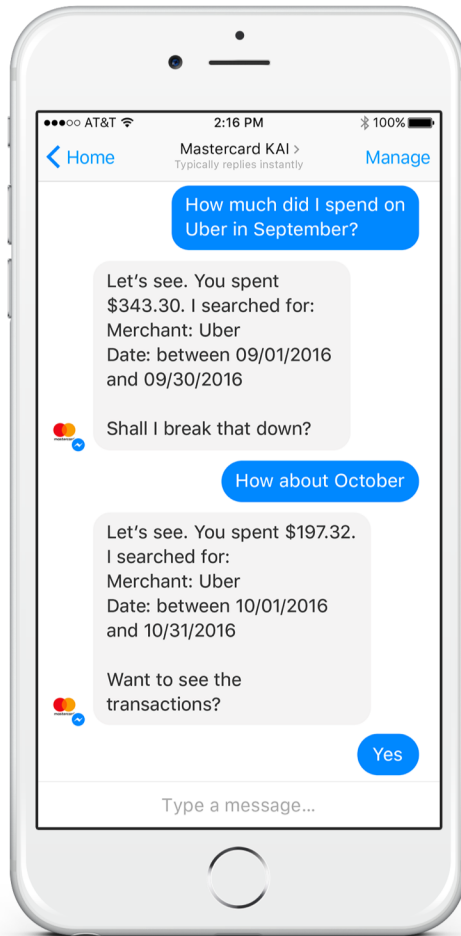
- Uber's chatbot on Facebook's messenger
- one main benefit: it loads much faster than the Uber app

Source: <http://www.guided-selling.org/from-e-commerce-to-conversational-commerce/>

Savings Bot



Mastercard Makes Commerce More Conversational

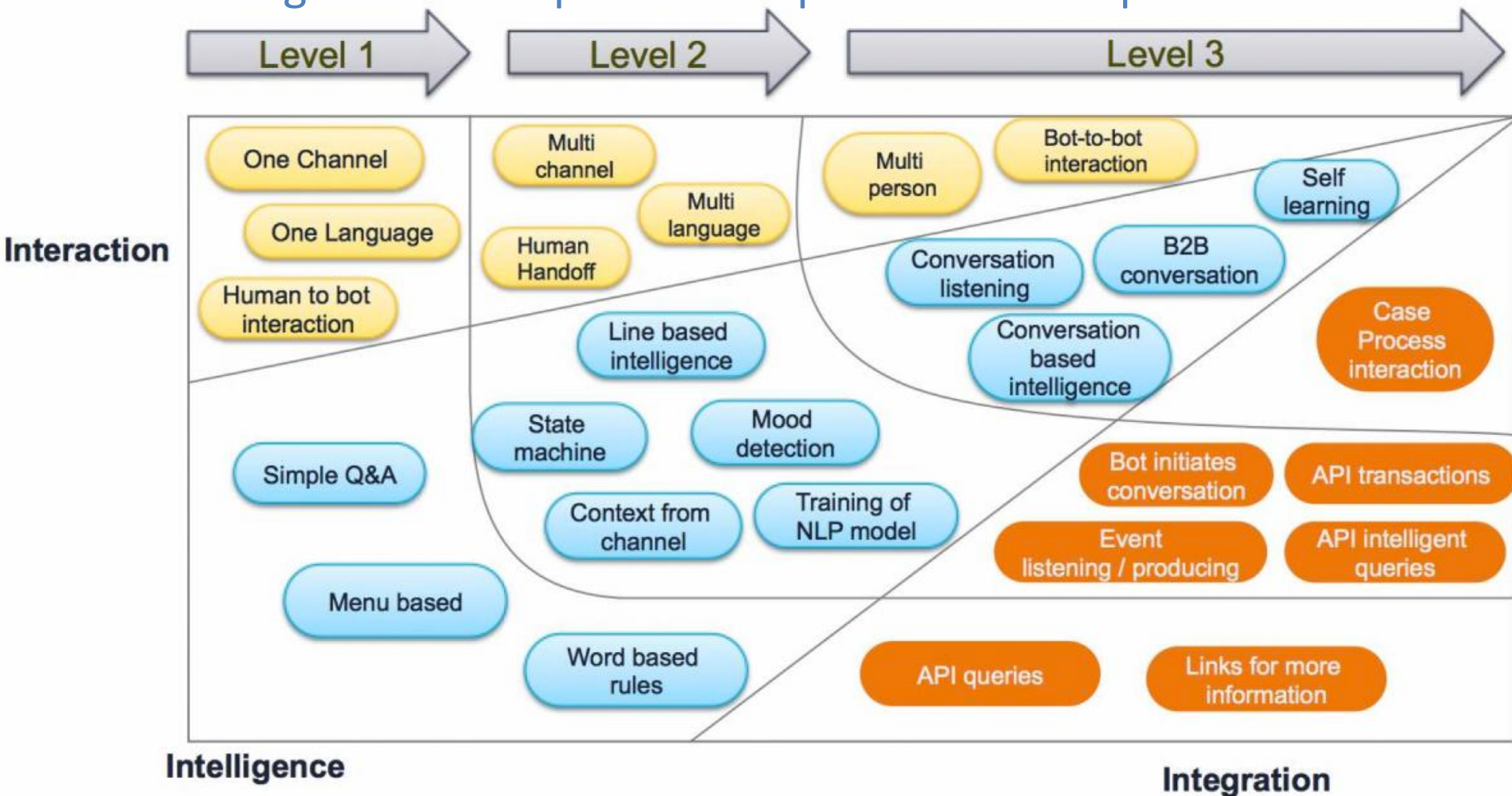


POWERED BY
Kasisto

Chatbots

Bot Maturity Model

Customers want to have simpler means to interact with businesses and get faster response to a question or complaint.



Question Answering (QA)

IMTKU

Question Answering System

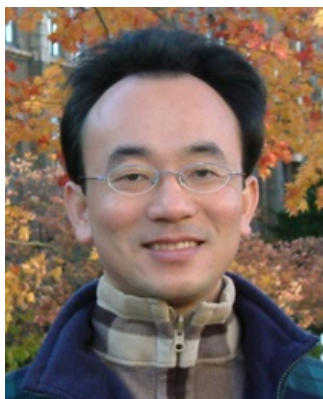
for

World History Exams

at NTCIR-13 QALab-3

IMTKU Textual Entailment System for Recognizing Inference in Text at **NTCIR-9** RITE

Department of Information Management
Tamkang University, Taiwan



Min-Yuh Day

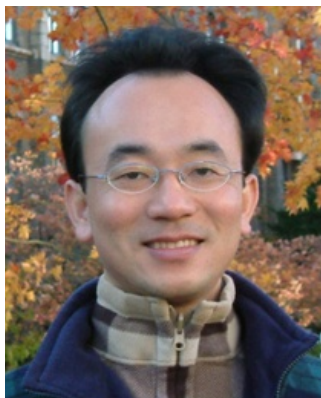


Chun Tu

myday@mail.tku.edu.tw

IMTKU Textual Entailment System for Recognizing Inference in Text at **NTCIR-10** RITE-2

Department of Information Management
Tamkang University, Taiwan



Min-Yuh Day



Chun Tu



Hou-Cheng Vong

myday@mail.tku.edu.tw



Shih-Wei Wu



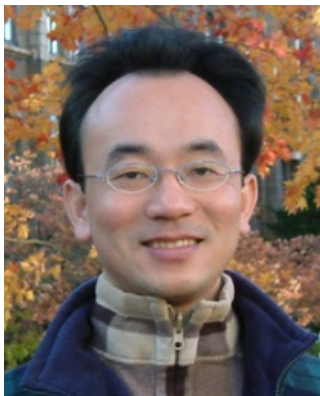
Shih-Jhen Huang

IMTKU Textual Entailment System for Recognizing Inference in Text at **NTCIR-11** RITE-VAL

Tamkang University

淡江大學

2014



Min-Yuh Day



Ya-Jung Wang



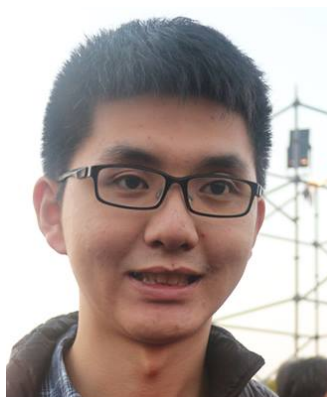
Che-Wei Hsu



En-Chun Tu



Huai-Wen Hsu



Yu-An Lin



Shang-Yu Wu



Yu-Hsuan Tai



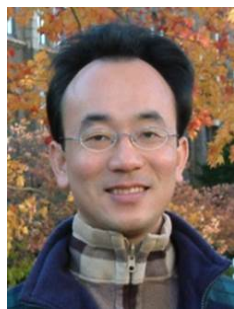
Cheng-Chia Tsai

2016

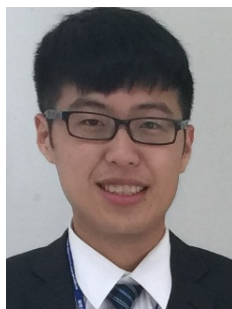
IMTKU Question Answering System for World History Exams at **NTCIR-12** QA Lab2

Department of Information Management
Tamkang University, Taiwan

Sagacity Technology



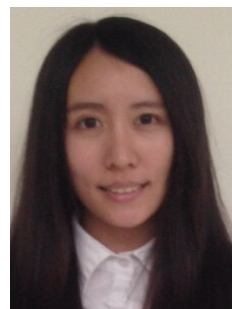
Min-Yuh Day



Cheng-Chia Tsai



Wei-Chun Chung



Hsiu-Yuan Chang



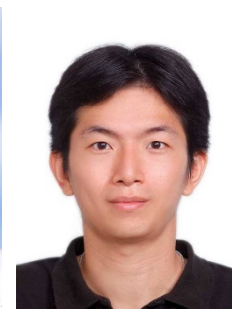
Tzu-Jui Sun



Yuan-Jie Tsai



Jin-Kun Lin



Cheng-Hung Lee



Yu-Ming Guo



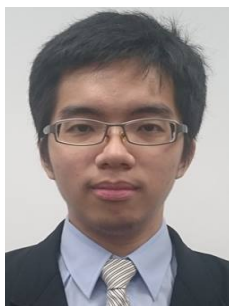
Yue-Da Lin



Wei-Ming Chen



Yun-Da Tsai



Cheng-Jhih Han



Yi-Jing Lin



Yi-Heng Chiang



Ching-Yuan Chien

myday@mail.tku.edu.tw

NTCIR-12 Conference, June 7-10, 2016, Tokyo, Japan

IMTKU Question Answering System for World History Exams at **NTCIR-13** QALab-3

Department of Information Management
Tamkang University, Taiwan



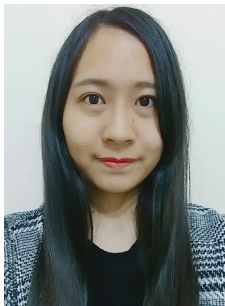
Min-Yuh Day



Chao-Yu Chen



Wanchu Huang



Shi-Ya Zheng



I-Hsuan Huang



Tz-Rung Chen



Min-Chun Kuo



Yue-Da Lin

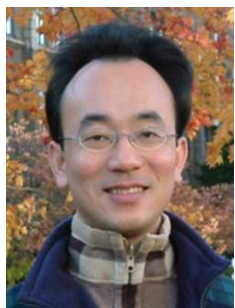


Yi-Jing Lin

myday@mail.tku.edu.tw

IMTKU Emotional Dialogue System for Short Text Conversation at **NTCIR-14** STC-3 (CECG) Task

Department of Information Management
Tamkang University, Taiwan



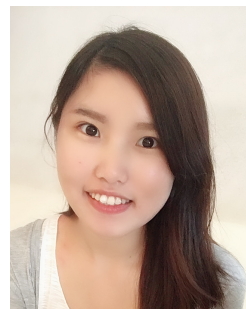
Min-Yuh Day



Chi-Sheng Hung



Yi-Jun Xie



Jhih-Yi Chen



Yu-Ling Kuo

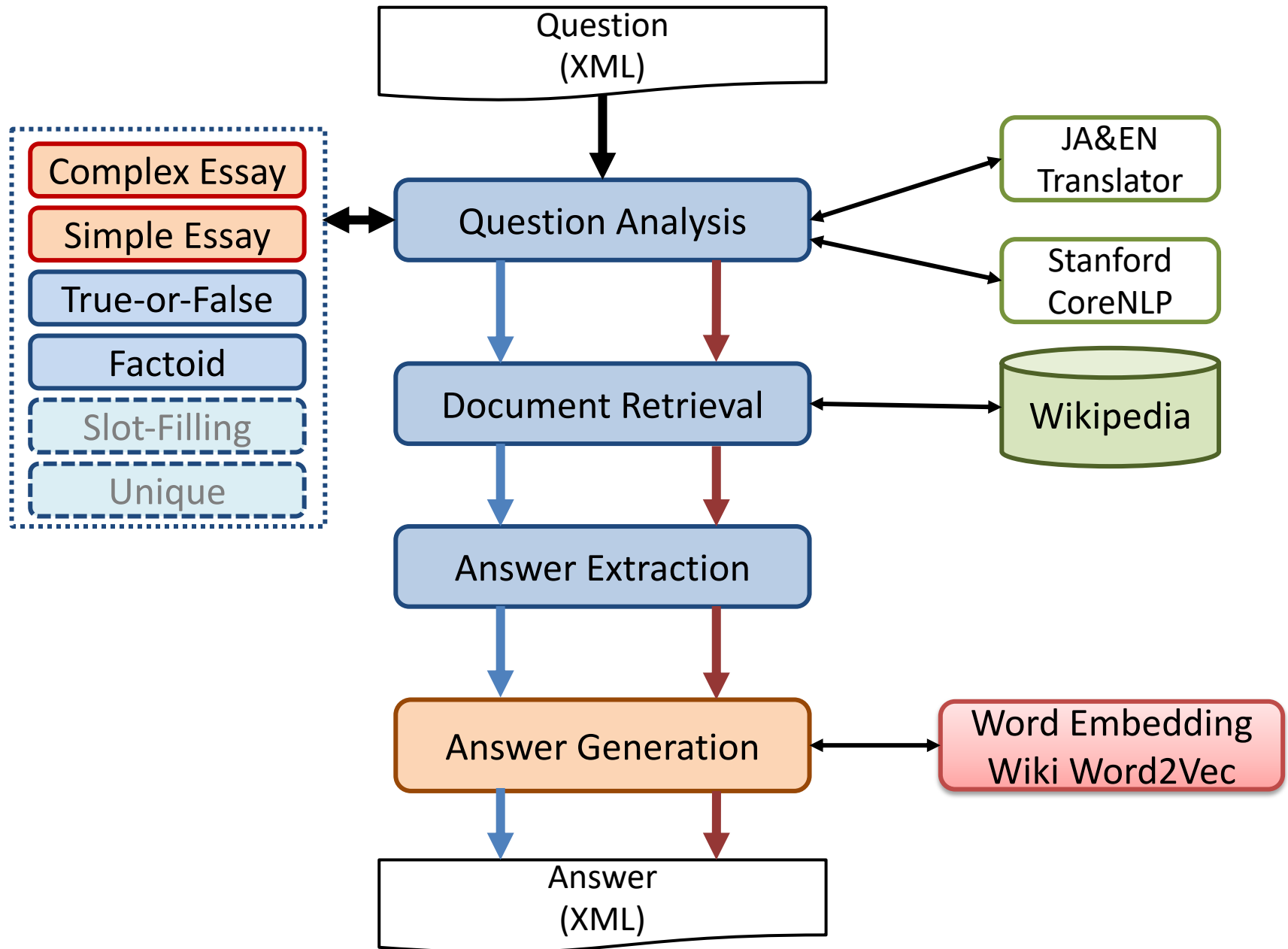


Jian-Ting Lin

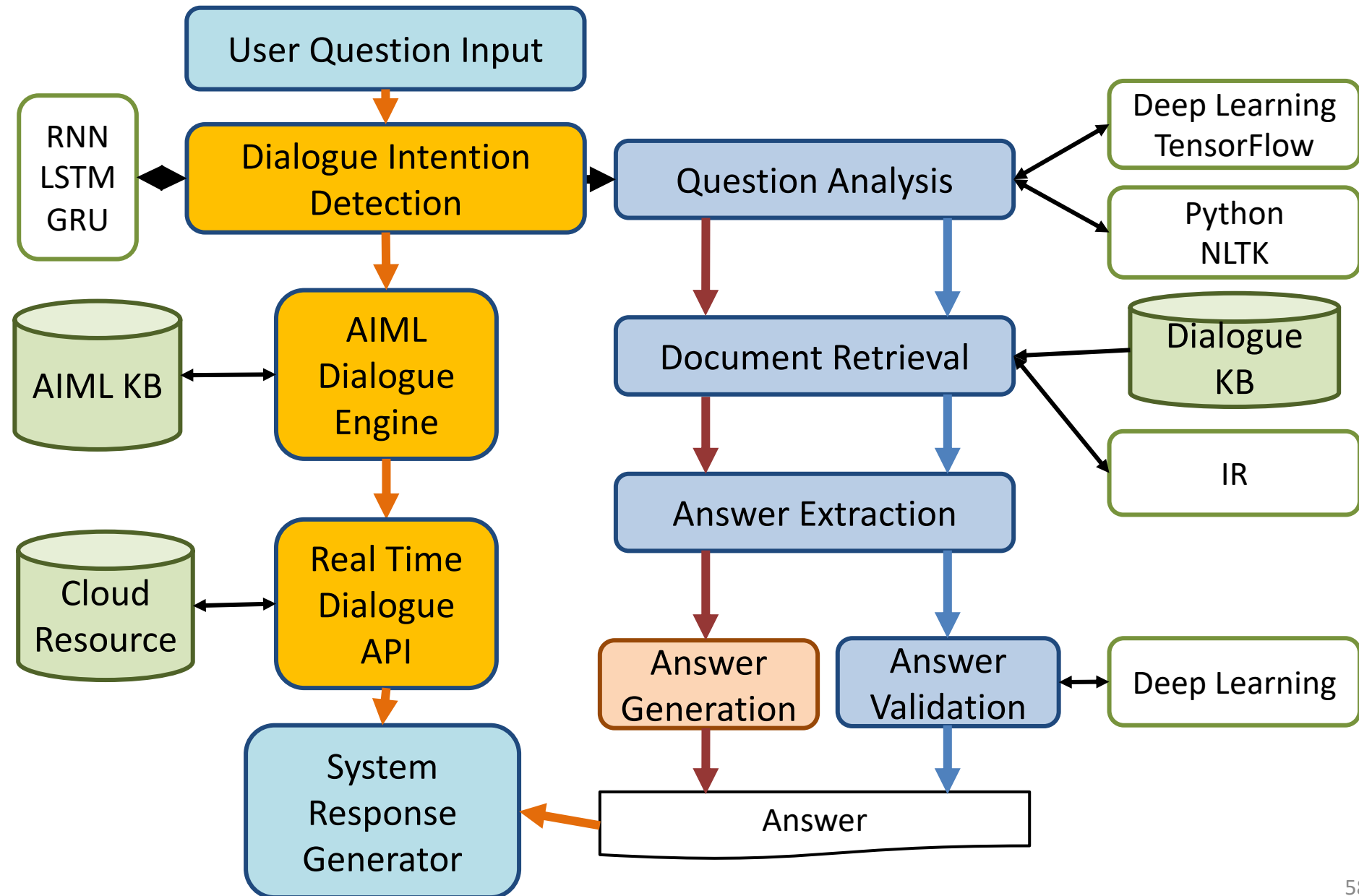
myday@mail.tku.edu.tw

NTCIR-14 Conference, June 10-13, 2019, Tokyo, Japan

IMTKU System Architecture for NTCIR-13 QALab-3



System Architecture of Intelligent Dialogue and Question Answering System





Short Text Conversation Task (STC-3)

Chinese Emotional Conversation Generation (CECG) Subtask

NTCIR Short Text Conversation

STC-1, STC-2, STC-3

	Japanese	Chinese	English	
NTCIR-12 STC-1 22 active participants	Twitter, Retrieval	Weibo, Retrieval		Single-turn, Non task-oriented
NTCIR-13 STC-2 27 active participants	Yahoo! News, Retrieval+ Generation	Weibo, Retrieval+ Generation		
NTCIR-14 STC-3		Weibo, Generation for given emotion categories		Multi-turn, task-oriented (helpdesk)
Chinese Emotional Conversation Generation (CECG) subtask				
Dialogue Quality (DQ) and Nugget Detection (ND) subtasks		Weibo+English translations, distribution estimation for subjective annotations		

Source: <https://waseda.app.box.com/v/STC3atNTCIR-14>

The 14th NTCIR (2018 - 2019)

NTCIR (NII Testbeds and Community for Information access Research) Project



Japanese



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NTCIR 14

NTCIR-14 Conference

NEWS

NTCIR-14 Aims

Call for Task Proposals

How to Participate

Task Participation

Task Overview/Call for
Task Participation

User Agreement Forms

Organization

Important Dates

Contact Us

NTCIR 13

NTCIR 12

NTCIR-14

The 14th NTCIR (2018 - 2019)

Evaluation of Information Access Technologies

January 2018 - June 2019

What's New

NEW February 1, 2018: [Call for participation to the NTCIR-14 Kick-Off Event released.](#)

NEW February 1, 2018: Call for participation to the NTCIR-14 QALab-PoliInfo Kick-Off Event released.

December 5, 2017: The NTCIR-14 Task Selection Committee has selected the following six Tasks.
Lifelig-3, OpenLiveQ-2, QA Lab-4, STC-3, WWW-2, CENTRE.

August 23, 2017: [NTCIR-14 Call for Task Proposals released.](#)(Closed.)

NEW About Proceedings

After the NTCIR-14 conference, a post-proceedings of revised selected papers will be published in [the Springer Lecture Notes on Computer Science \(LNCS\) series.](#)

Lecture Notes in
Computer Science

<http://research.nii.ac.jp/ntcir/ntcir-14/index.html>

NTCIR-14 STC-3

Short Text Conversation Task (STC-3)

Chinese Emotional Conversation Generation (CECG) Subtask



Short Text Conversation Task (STC-3)

Chinese Emotional Conversation Generation (CECG) Subtask

[Home](#)[Task Definition](#)[Dataset Description](#)[Evaluation Metric](#)[Time Schedule](#)[Copy Rights & Contacts](#)

Call for Participation

In recent years, there has been a rising tendency in AI research to enhance Human-Computer Interaction by humanizing machines. However, to create a robot capable of acting and talking with a user at the human level requires the robot to understand human cognitive behaviors, while one of the most important human behaviors is expressing and understanding emotions and affects. As a vital part of human intelligence, emotional intelligence is defined as the ability to perceive, integrate, understand, and regulate emotions. Though a variety of models have been proposed for conversation generation from large-scale social data, it is still quite challenging (and yet to be addressed) to generate emotional responses.

In this challenge, participants are expected to generate Chinese responses that are not only appropriate in content but also adequate in emotion, which is quite important for building an empathic chatting machine. For instance, if user says “My cat died yesterday”, the most appropriate response may be “It’s so sad, so sorry to hear that” to express sadness, but also could be “Bad things always happen, I hope you will be happy soon” to express comfort.

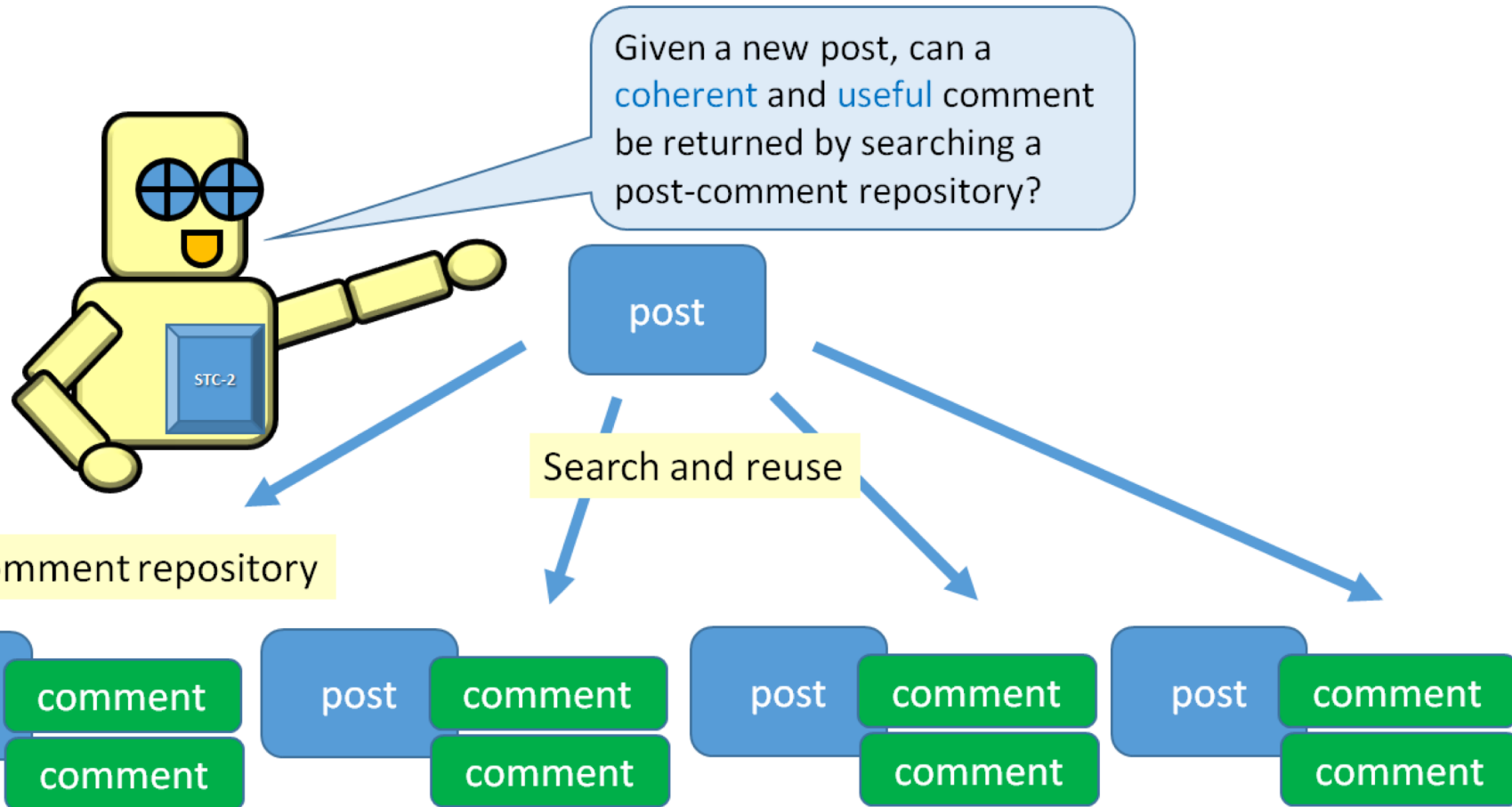
[Previous Evaluation Challenge at NLPCC 2017](#)[Overview of the NLPCC 2017 Shared Task: Emotion Generation Challenge](#)

Links

[NTCIR-14](#)[STC-3 NTCIR-14 STC-3](#)[NLPCC 2017](#)

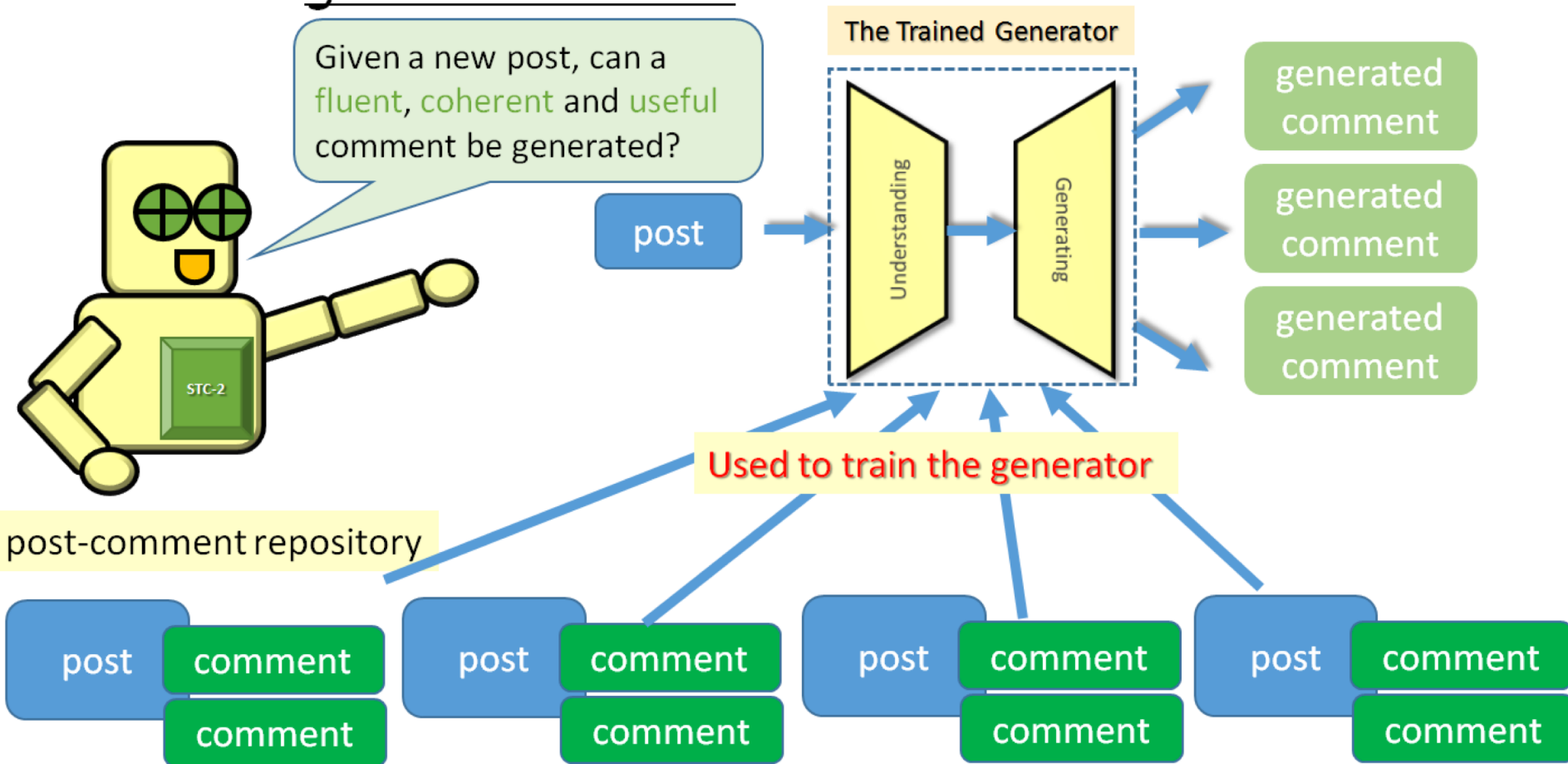
Short Text Conversation (NTCIR-13 STC2) Retrieval-based

retrieval-based method



Short Text Conversation (NTCIR-13 STC2) Generation-based

generation-based method



Given post:

爱狗还会做饭的男人，最帅了！

The man who cooks and loves dogs is very handsome!

Response	Chinese / Translated English	Emotion Class	Coherence and Fluency	Emotion Consistency	Label
Response 1	会做饭的男人是很帅的啊。 The man who cooks is handsome.	喜欢 Like	Yes	Yes	2
Response 2	哈哈，我也觉得。 Haha, I feel the same way.	喜欢 Like	Yes	No	1
Response 3	这是哪部电影里的？ Which movie is this from?	厌恶 Disgust	No	Yes	0
Response 4	哈哈,你也是。 Haha, the same to you.	喜欢 Like	No	No	0
Response 5	我爱你会。 I love you, will you.	厌恶 Disgust	No	Yes	0
Response 6	这是同主义同的道！ This is the same way of the same doctrine!	厌恶 Disgust	No	No	0

NLPCC

Emotion Classification Challenge

6 classes (64%)

- 0: Other
- 1: Like
- 2: Sadness
- 3: Disgust
- 4: Anger
- 5: Happiness

Chinese Emotional Conversation Generation (CECG)

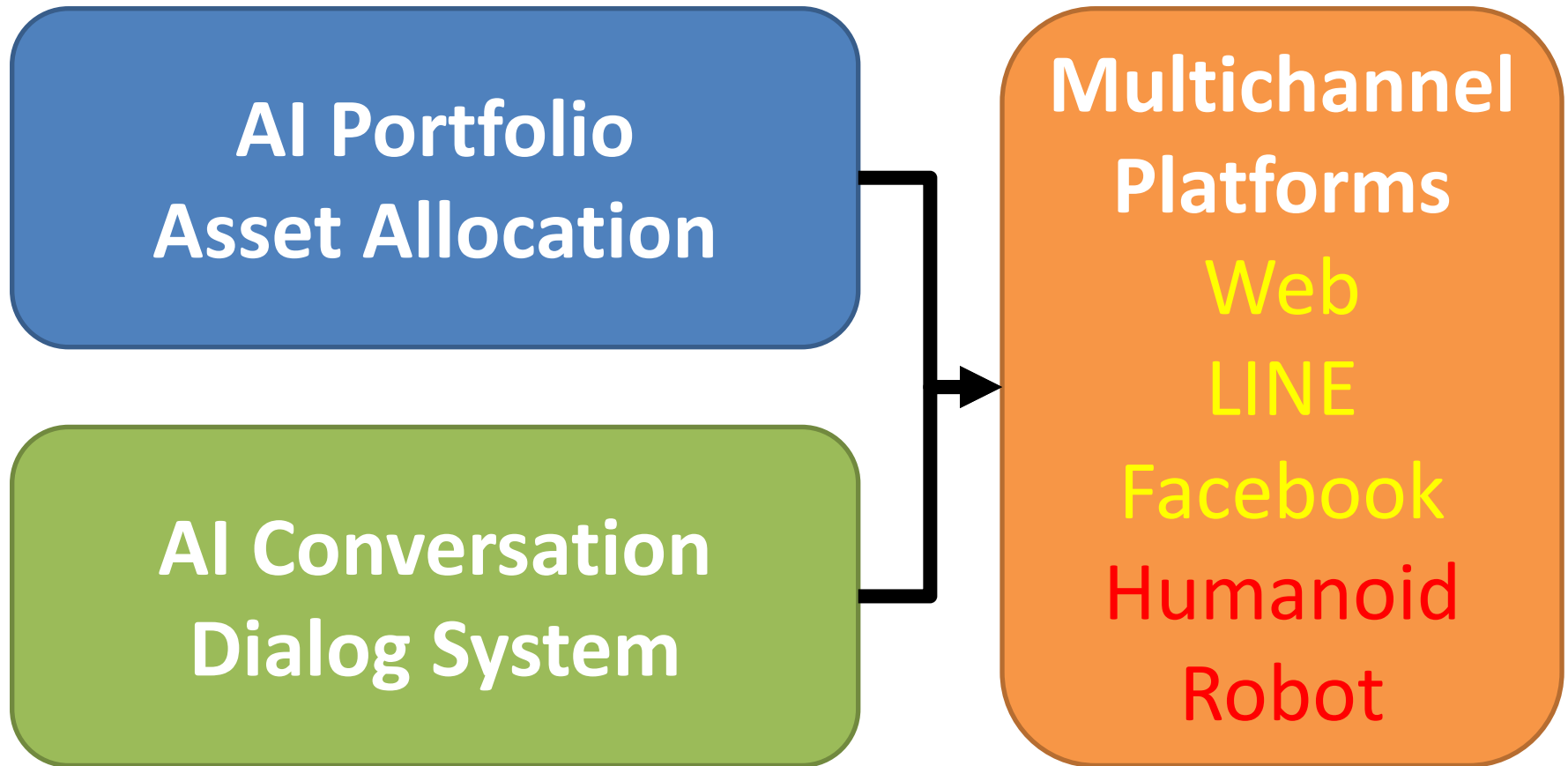
Post (Given)	Emotion Category (Given)	Response (to be generated)
爱狗还会做饭的男人，最帅了！ The man who cooks and loves dogs is very handsome!	喜欢 Like	会做饭的男人是很帅的啊。 The man who cooks is handsome.
爸爸，明天是六一啦，带我出去玩吧！ Daddy, tomorrow is June 1th Children's Day. Please take me out to play!	喜欢 Like	好，一定带。 Yes, of course.
被特别在乎的人忽略，会很难过，而装做不在乎，会更难过。 It's sad to be ignored by someone that you really care, and it's harder to pretend that you don't care.	悲伤 Sadness	因为在乎，所以在乎。 I am concerned with it, because I care about it.
冰天雪地的哈尔滨！你要冻死我咋地？！？！ Harbin is in the snow! Are you going to freeze me to death?!?!?	喜欢 Like	注意保暖，小心别感冒！ Keep warm. Watch out for getting cold!
本来想学一把沧桑，结果令我更忧伤。 I wanted to learn the vicissitudes of life, but I became sadder.	悲伤 Sadness	这是一个悲伤的故事。 It a sad story.
今天一整天都在海边训练。虽然很累，但还是很开心的！ I have been training at the seaside all day. Though very tired, I still very happy!	快乐 Happiness	是的呢，开心！ Yeah, happy!

Sample responses generated by Seq2Seq and ECM (Emotional Chatting Machine)

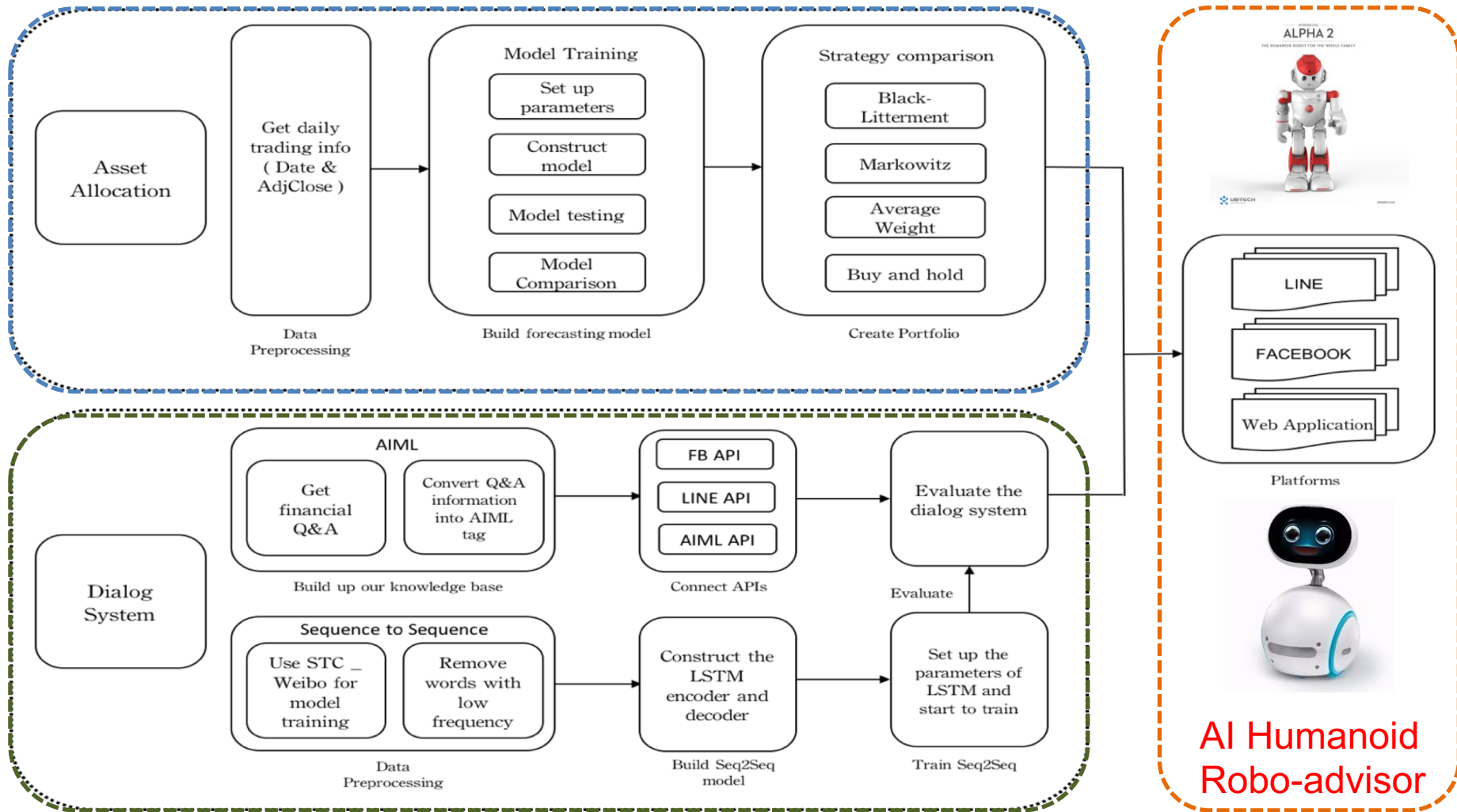
Post	Model		Response(Original)	Response(Translated)
承诺，就是一个骗子说给一个傻子听的。 A promise is what a cheater says to a fool.	Seq2Seq		承诺，就是一个骗子说给一个傻子听的。	A promise is what a cheater says to a fool.
	ECM	Like	承诺是一个 专一 的傻子	Promise is a single-minded fool
		Happy	我就是个 开心 的傻子	I'm just a happy fool
		Sad	我就是个 悲伤 的傻子	I am a sad fool
		Disgust	一个 骗子 说给一个 傻子 听	A cheater says to a fool
		Angry	不管你信不信，反正我信了！	Whatever you believe or not, I trust in it!
知道真相的我眼泪笑下来 Knowing the truth, I laughed myself to tears	Seq2Seq		知道真相的我眼泪掉下来。	After knowing the truth, I burst into tears.
	ECM	Like	太 可爱 了，太 可爱 了！	Too lovely , it's too lovely .
		Happy	笑得我眼泪都出来了。	I can't help laugh myself to tears.
		Sad	知道真相的我 眼泪 掉下来。	After knowing the truth, I burst into tears .
		Disgust	这是真的还是假的？	Is this true?
		Angry	什么意思？没看懂。	What do you mean? I don't understand.

AI Humanoid Robo-Advisor

AI Humanoid Robo-Advisor for Multi-channel Conversational Commerce

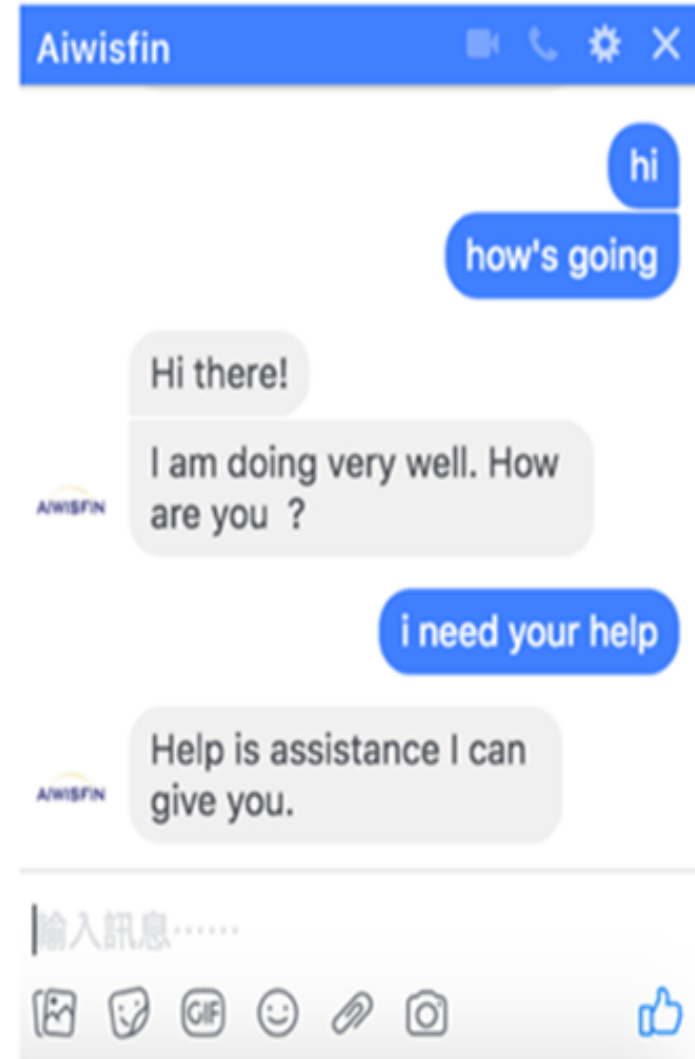


System Architecture of AI Humanoid Robo-Advisor



AI Humanoid
Robo-advisor

Conversational Model (LINE, FB Messenger)



Conversational Robo-Advisor

Multichannel UI/UX

Robots



ALPHA 2

ZENBO



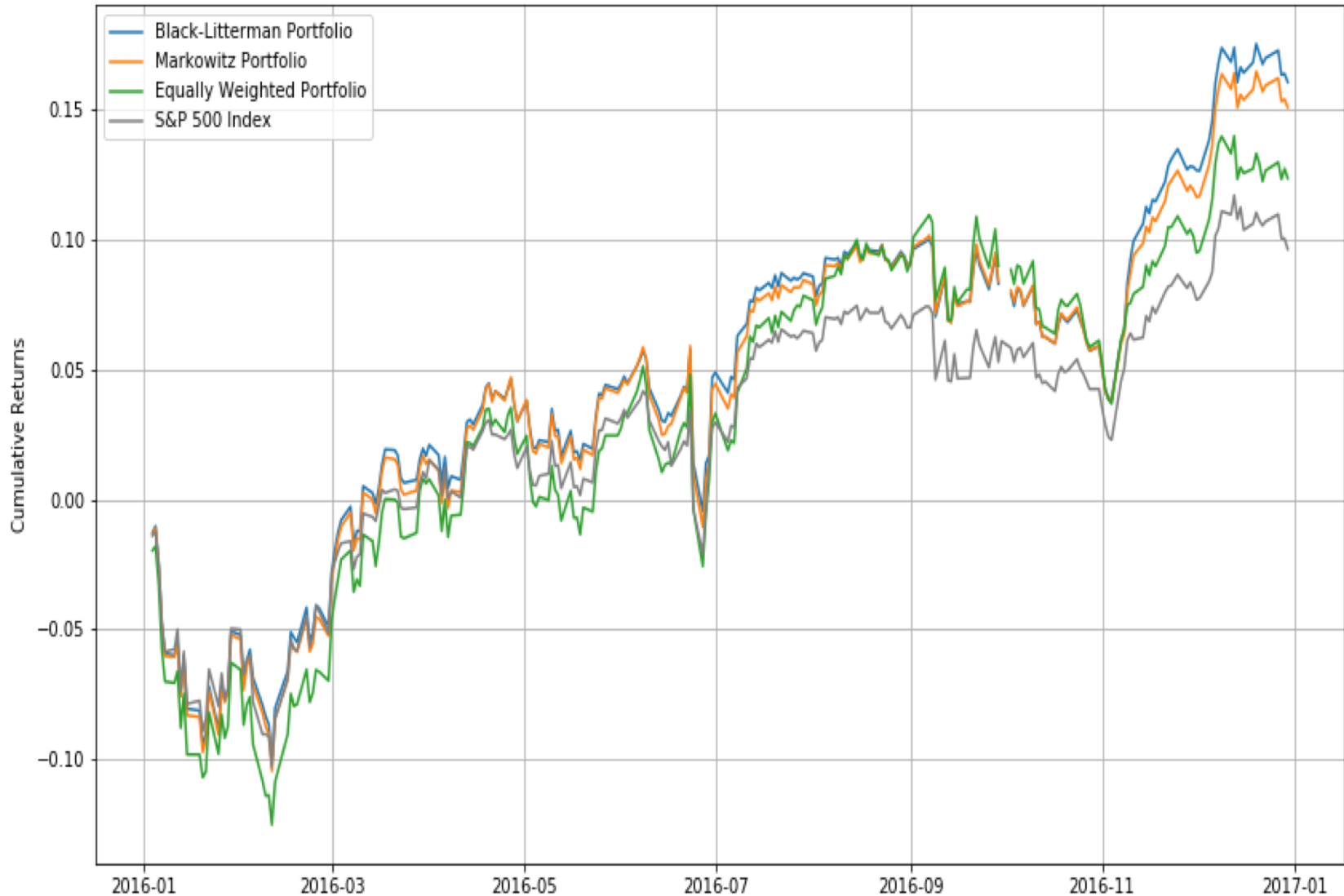
Portfolio Performance in 2016

Annual Portfolio Statistics

	Black-Litterman Portfolio - the LSTM Investor Views	Markowitz Portfolio	Equally Weighted Portfolio	S&P 500 Index
Annual return	16.151%	15.172%	12.428%	9.643%
Annual volatility	13.897%	14.365%	15.870%	13.169%
Sharpe ratio	1.14697	1.05534	0.81762	0.76492
Stability	0.82500	0.82515	0.82514	0.78754
Max drawdown	-10.105%	-10.465%	-12.529%	-10.306%
Skew	-0.35652	-0.52985	-0.56976	-0.36795
Kurtosis	2.49845	3.00613	2.41894	2.21958
Daily value at risk	-1.688%	-1.750%	-1.948%	-1.619%
Alpha	0.06445	0.05354	0.02158	0.00000
Beta	1.01485	1.04816	1.15631	1.00000
Information ratio	0.10935	0.09129	0.04655	-

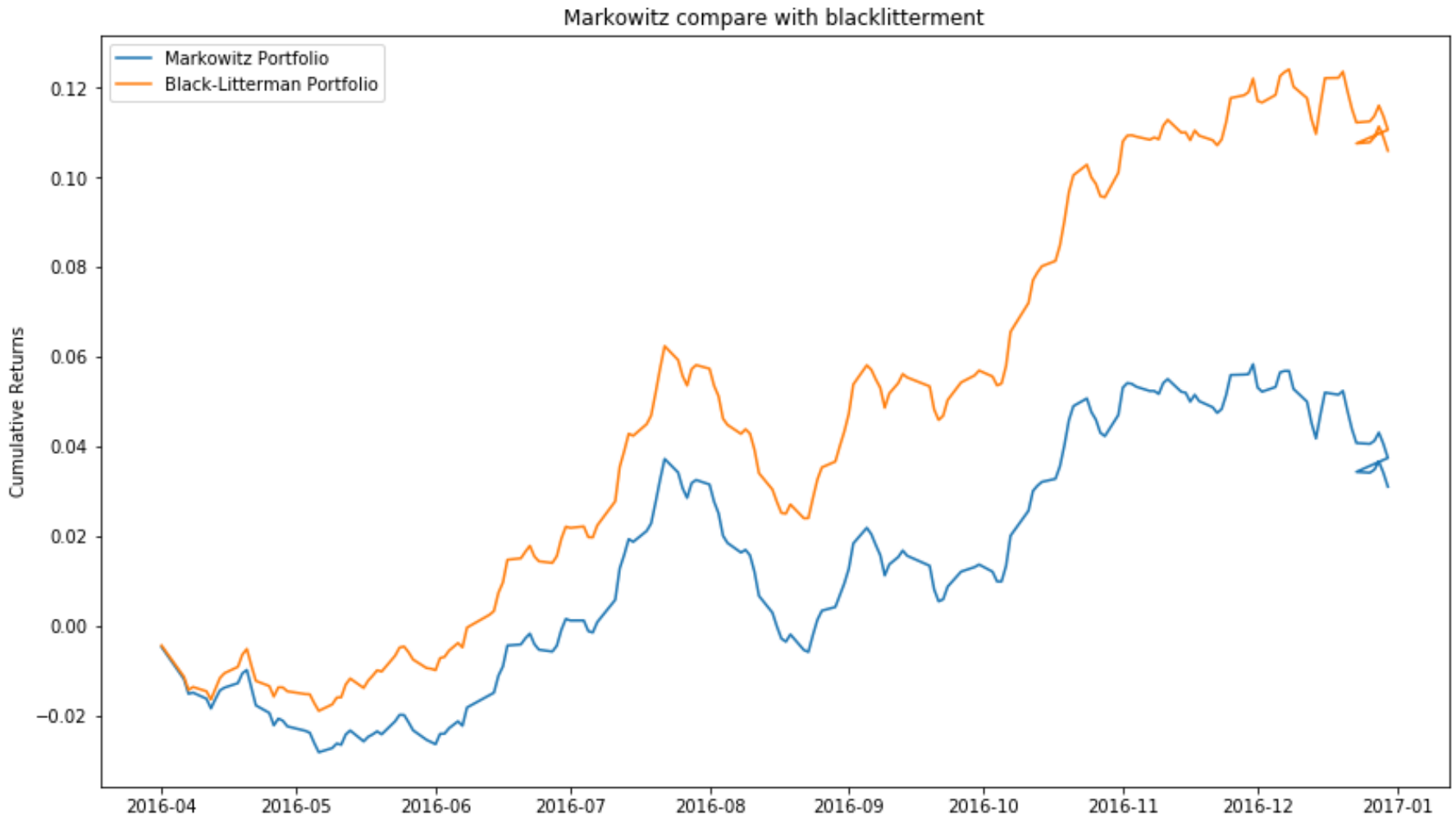
Portfolio Cumulative Returns

Cumulative Returns: Portfolios



Cumulative Returns

Markowitz v.s. Black-litterment



Source: Min-Yuh Day, Jian-Ting Lin and Yuan-Chih Chen (2018), "Artificial Intelligence for Conversational Robo-Advisor", in Proceedings of the 2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2018), Barcelona, Spain, August 28-31, 2018

IEEE EM-RITE 2019

The 8th IEEE International Workshop on Empirical Methods for Recognizing Inference in TExt (IEEE EM-RITE 2019)

In conjunction with IEEE IRI 2019

Los Angeles, California, USA

July 30 - August 1, 2019

<https://sites.google.com/view/emrite2019>

MSNDS 2019

The 10th International Workshop on Mining and Analyzing Social Networks for Decision Support (MSNDS 2019)

In conjunction with IEEE/ACM ASONAM 2019

Vancouver, Canada

27-30 August, 2019

<https://sites.google.com/view/msnds2019/>

Summary

- **AI Robo-Advisor in FinTech**
- **Conversational Commerce**
- **AI Humanoid Robo-Advisor**

References

- Day, Min-Yuh, Tun-Kung Cheng and Jheng-Gang Li. "AI Robo-Advisor with Big Data Analytics for Financial Services", submitted to MSNDS 2018 in the 2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2018), Barcelona, Spain, August 28-31, 2018.
- Day, Min-Yuh, Jian-Ting Lin and Yuan-Chih Chen. "Artificial Intelligence for Conversational Robo-Advisor." submitted to MSNDS 2018 in the 2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2018), Barcelona, Spain, August 28-31, 2018.
- Day, Min-Yuh, Tun-Kung Cheng and Jheng-Gang Li. "Artificial Intelligence for Time Series Forecasting in Financial Markets." International Conference on INTERNET STUDIES (NETs 2018), Takamatsu, Japan, April 2-4, 2018.
- Day, Min-Yuh, Chao-Yu Chen, Wan-Chu Huang, I-Hsuan Huang and Shi-Ya Zheng, Tz-Rung Chen, Min-Chun Kuo, Yue-Da Lin, and Yi-Jing Lin. "IMTKU Question Answering System for World History Exams at NTCIR-13 QA Lab-3." The 13th NTCIR Conference on Evaluation of Information Access Technologies (NTCIR-13), Tokyo, Japan, December 5-8, 2017.
- Kato, Makoto P., and Yiqun Liu,. "Overview of NTCIR-13." In Proceedings of the 13th NTCIR Conference, 2017.
- Huang, Minlie, Zuoxian Ye, and Hao Zhou. "Overview of the NLPCC 2017 Shared Task: Emotion Generation Challenge." In National CCF Conference on Natural Language Processing and Chinese Computing (NLPCC), pp. 926-936. Springer, Cham, 2017.
- Zhou, Hao, Minlie Huang, Tianyang Zhang, Xiaoyan Zhu, and Bing Liu. "Emotional chatting machine: emotional conversation generation with internal and external memory." arXiv preprint arXiv:1704.01074 (2017).
- Yu, Kai, Zijian Zhao, Xueyang Wu, Hongtao Lin, and Xuan Liu. "Rich Short Text Conversation Using Semantic Key Controlled Sequence Generation." IEEE/ACM Transactions on Audio, Speech, and Language Processing (2018).

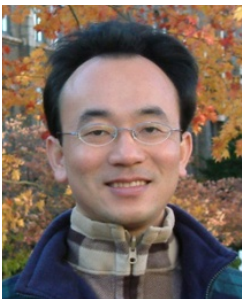
AI Humanoid Conversational Robo-Advisor

Time: 10:30-12:00, 2019/5/6 (Monday)

Place: A205, Engineering Building 5, NCU

Host: Prof. Chia-Hui Chang,

Department of Computer Science and Engineering, National Central University



Min-Yuh Day

Assistant Professor

**Dept. of Information Management,
Tamkang University**

<http://mail.tku.edu.tw/myday/>

2019-05-06

