

Educational Programs

Big Data Institute

Hong Kong and nation's Big Data Research Center Technology Transformation

Funding Support Industry Applications

STREET

Scientific Research

Talent Training

Recruit talents in academia Navigate research development

BRA

Industrialize

scientific achievements and create long-term impact to the world **Aspire** innovation and breakthrough

> **Benefit** the Greater Bay Area (HK / Macau / Guangdong), Greater China Region and the world

Mission and Vision



from interdisciplinary Schools and Departments for 16 collaborative R&D projects and 4 joint labs



BDI

ACHIEVEMENT

HIGHLIGHTS

Over HK\$ 80 million & US\$ 1 million

industrial sponsorship and donation with one of the largest government-funded ITF Smart City Project



WeChat

Overseas Joint Lab in Asia

KSTP

Hong Kong Society of Americal Intermance and Robotics 百元人工当能会提供法人学会

and more...

Line/Naver Overseas Joint Lab in the World NAVER

C-) Alibaba Cloud

《 京东

Oxiao-i 小i机器人



Trained **400+** BDT Master Students

Microsoft

ByteDance

Partnership with

leading companies



BDI Team

At present, there are more than **50 faculty members** and over **120 students** involved BDI's **16 research projects** from

- School of Engineering
- School of Science
- School of Business & Management
- Department of Computer Science and Engineering
- Department of Industrial Engineering and Decision Analytics
- Department of Electronic and Computer Engineering,
- Department of Chemical and Biological Engineering
- Department of Information Systems, Business Statistics and Operations Management
- Department of Mathematics
- Division of Life Science
- Division of Social Science











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Angela Wu 吳若昊 of Chemical and Biological Engineering, and Division of Life Science, HKUST

Yu Hu 胡禹 Assistant Professor, Department Assistant Professor, Department of Mathematics, and Division of Life Science, HKUST



2015 RMB ¥ 10 million Tencent



• 2016 US\$ 1 million Mr. Raymond Chu

2015 HK\$ 10 million ITF (Innovation and Technology Fund) Smart Transportation project partnered with THALES

> 2016 HK\$ 20 million ITF (Innovation and Technology Fund) Smart City project

2018 HK\$ 5 million Ying Ding Education Technology Co., Ltd

partnered with

Forgame 2018 HK\$ 2 million :

Donation

Industrial Partners and Donation



OUR LABS





BDBI-Machine Learning Lab



Smart City Lab



HKUST-Ying Ding Education AI Lab













Lee Shau Kee Business Building

BIG DATA INSTITUTE



WeChat-HKUST Joint Lab on Artificial Intelligence WHAT Lab



2015-11-26 WHAT Lab was established in HKUST

Tencent entered into a 5-year research partnership with BDI since late 2015, amounts to RMB10 million in total.

WeChat and HKUST will jointly conduct Artificial Intelligence (AI) Technology related research and explore the far-reaching frontiers of AI. This collaboration on AI research is expected to be long-term and world-leading. Research areas of WHAT LAB include intelligent robotic systems, natural language processing, data mining, speech recognition and understanding.



Machine Reading aims to develop Machine Learning algorithms that could read and comprehend natural language documents as humans do.

With Machine Reading, natural language information is converted to the form that could be processed by computers, and could be further utilized in applications such as summarization, question answering and dialogue system. Aims at social networking big data mining and machine learning, natural language processing and robotics research.

- Natural language processing
- > Data Mining & Visualization
- ➢ Video Analysis
- Large –Scale Machine Learning
- \succ Robotic Application



Machine Reading: Breakthrough in Natural Chinese Processing It aims to develop Machine Learning algorithms that could read and comprehend natural language documents as humans do, the technique can be further utilized in applications such as summarization, question answering and dialogue system. Natural language processing > Data Mining & Visualization ➢ Video Analysis Large – Scale Machine Learning **Robotic** Application

据印度报业托拉斯报导,当地时间 2日,在巴基斯坦接壤印度的巴方 边境口岸瓦格赫发生了一起自杀式 炸弹袭击。根据最新消息,这起袭 击事件造成了至少55人死亡,其中 包括了孩子和安全人员,另有近 200人受伤。巴基斯坦官员表示, 此次的事件是一起自杀式袭击。



Human

印巴边境发生自杀式袭击致55 人死亡

Machine

EAV

巴基斯坦发生自杀式炸弹袭击 事件造成至少55人死亡



Dialog Robot

Through the dialogue system, computer information can be translated into natural language description, and human language can also be translated into computer information, so as to achieve human-computer interaction.

Reinforcement and transfer learning, can be used to solve the problem of dialogue system. Reinforcement learning can solve the problem of delayed feedback in multiple rounds of dialogue, while transfer learning can help target areas by using data from similar fields, which can solve the problems of traditional intensive learning data.



Domain Specific Knowledge Graphs

• Medical Knowledge Graphs

8 Entity Search	Q ENTITY RECOGNITION			
A Relation Search	# Home / Q, Entity Recognition			
Question Answering	Input Text :			
☆ Entity Recognition	I I I I I I I I I I I I I I I I I I I			
	Submit!			
	(Show Entities)			

Model-based Global Localization for Aerial Robots using Edge Alignment

Kejie Qiu, Tianbo Liu and Shaojie Shen



High resolution video available at:

http://www.ece.ust.hk/~eeshaojie/ral2017kejie.mp4





WeChat Crowdsourcing Platform



The WeChat Crowdsourcing Platform is designed and developed by WHAT Lab and WeChat team together. Researchers can publish crowdsourcing tasks on the platform and WeChat users can participate in and get monetary rewards. Different mechanisms for task assignment and answer aggregation are equipped and plenty of real tasks from HKUST and Tencent have been published and finished on the platform. It is both a useful tool for data labeling and an industry level crowdsourcing research environment.



WeSeer System: go online



这次微信人工智能实验室 WHAT Lab 用数据可视化算法也看了一回《人民的名义》



4月20日~4月22日



2017 年 4 月 20 日,带有《人民的名义》标题的微信文章转发次数达到了 575000 次,朋友 圈几乎被以达康书记为首的汉东男子天团所占领,可以看到很多人对大结局充满了期待。 The WeSeer system developed by WHAT Lab was deployed and applied to WeChat, Tencent for daily propagation analysis. The system enable to analysis how official public account article information propagate in WeChat platform from different perspectives, involving a 3D global overview, time-varying propagation view, community detection view, etc.

微信小秘密: 2016 年那些 10w+ 文章是怎么刷爆朋友圈的?

Original 2016-12-30 WeChat TechPower WeChat TechPower





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BIG DATA INSTITUTE

BDBI



Big-Data Bio-Intelligence and Machine Learning Lab



The Big Data for Bio Intelligence Laboratory (BDBI)

Donation by Mr. Raymond Chu: US \$1 million

Devote to the development of advanced machine learning systems and promoting applications of machine learning in bio and genetic areas, aims to become a leading laboratory in the research of big data for biological intelligence and to bridge the knowledge gap between academics and practitioners.



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BIG DATA INSTITUTE



Smart City Lab

MARTCITY BY SMARTCITY GROUP

Smartcity, a new perspective of Hong Kong

A DATA PORTAL SITE CONSTRUCTED BY SMARTCITY GROUP

Get started \rightarrow

R

Smart City Lab

Smart Ridesharing

With the cooperation of **DiDi** (the biggest online car-hailing company in Mainland China), we can utilize the huge amount of data generated by millions of drivers and customers to help the company improve the efficiency of their services and the user experience of both drivers and customers. We help DiDi to design smart vehicle dispatching strategies and dynamic pricing strategies such that the efficiency of the ridesharing service can A fare price? be improved, and the overall profit of the platform can increase.







\$

E-LEARNING

Move Academia towards "Evidence-Based Education":

Stage 1: Multi-Variant Model for Quality Measurement of Course Materials.

Stage 2: Pattern Discovery Algorithms & Outlier Detection Mechanism.



Objectives of the platform

- Effectively monitoring and directing the crowd in railway stations so that early warnings can be given on potential dangers.
- Ensuring smooth operation of railway transport system by predicting potential major equipment failure.
- The platform will cover a number of frontiers of big data research, including data integration, data analysis, human factors, optimization/visualization, transfer of learning, simulation and operational research.





Lee Shau Kee Business Building

BIG DATA INSTITUTE



HKUST- Ying Ding Education AI Lab







Ying Ding Education co. funded HK\$5 *million to establish a collaboration with BDI for founding an AI lab.*



HKUST- Ying Ding Education AI Lab

The Lab focuses on developing collaborative programs for the purpose of strengthening educational research collaborations and development of blended learning initiatives.

✓ Development of Blended Learning Platform and Pilot Program Collaboration on Mainland Educational Activities ✓ Collaboration on Educational Data Analysis



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BIG DATA INSTITUTE

日xiao-i 小i机器人

Forgame

NAVER





Established Joint Labs



HKUST-NAVER/LINE AI Laboratory

The lab aims to develop a comprehensive set of research and talentdevelopment programs to pursue cutting-edge research for advancement of AI technology and enrich the learning experience for students.

NAVER



HKUST-Xiaoi Robot Joint Lab on Machine 6 Learning and Cognitive Reasoning

The Joint Lab will emphasis on integrating machine learning and cognitive reasoning to build the next generation AI system with high credibility and cognitive capabilities. It will also train student talent in AI and foster research and industry collaboration, contributing to the societal and economic development of Hong Kong and the Greater Bay Area.

Established Joint Labs



Digital Currency and Blockchain Research Lab Sorgame

The Lab will support research and training of postgraduate / postdoctoral students related to FinTech and blockchain.



Health Data Analytics Lab



The Lab will support research related to data science and provide a platform for nurturing young researchers.

Upcoming Joint Labs



HKUST-Accel Joint Laboratory on Internet of Things (IoT)



NEW PROJECT



Intelligent Document Assistance System

- New word discovery based on left and right entropy and internal solidification
- Correction of typos based on neural network
- Research on entity recognition model based on neural network
- Picture text detection and recognition algorithm
- Seal extraction and recognition algorithm



NEW PROJECT: **E**Intelligent Document Assistance System

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综合类业务智能辅助系统 ② 智能辅助 ~	导航页		
③ 系统配置 ~	智能辅助		
	科技奖励形式审查	科技项目立项申请书形式审查	智能查重
	点击进入	点击进入	点击进入
	专家推荐	项目分类	智能秘书
	总览	点击进入	点击进入
	专家页		
	系统设置		
	科技奖励形式审查配置		
	点击进入		









BigDatathon



Distinguished Lectures, Seminars, Workshops

Social Impact

Organize Distinguished Lectures, Seminars, Workshops, Competitions, Forums to facilitate knowledge transfer



Xiao-i and HKUST Launch Joint Laboratory on Machine Learning and Cognitive Reasoning



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昭留影

Institute

HKUST Signed Framework

Agreement with Digital China

to Build Smart City Research



圖1之1-科大工學院院長鄭光廷(左二起)、科大副校長(研究及發展)華玉.....(林穎茵攝)

Social Impact

HKUST Establishes Laboratory on Big Data for Bio Intelligence

科大設大數據生物智能實驗室



●人民网 人民网 >> 港澳

香港致力打造大数据驱动的智慧城市

來新見解

方案

2016年06月29日12:42 来源:新华社

香港文匯報訊 (記者 高鈺) 香港科技大學昨正式

成立大數據生物智能實驗室,為生物學及醫療保健方

面設計大數據分析方案,實驗室將由科大新明工程學 教授、計算機科學及工程學系講座教授兼系主任楊

指大數據的應用將會為人類的生活帶來革命性的轉

變,有關研究是該校策略發展方向之一,而隨着實驗

室的成立,他深信科大能為大數據研究的迅速發展帶

大數據生物智能實驗室的研究範疇包括「深度學習

,即诱過豐富功能描述機器的學習問題

域中應用的「直推式遷移學習」。實驗室亦會專注研

究基因養殖、令過程更為自動化和易於使用、以及配

讓電腦作出決定;以及能讓電腦模型輕易

,及數學系講座教授兼系主任汪揚共同領導 科大校長陳繁昌特別鳴謝實業家朱慧恒的捐助,又

原标题: 香港致力打造大数据驱动的智慧城市

"我们的口号是要把香港打造成大数据驱动的智慧城市。" 香港科技大学计算 机科学与工程学系系主任杨强对新华社记者说,在他的牵头下,科大组织了一批专 家开展智慧城市建设的研究和大数据的应用。

香港特区行政长官梁振英在《2016年施政报告》中也提到,特区政府将与 科研及公私营机构共同研究建设智慧城市。特区政府创新及科技局(创科局)将负 责制定智慧城市的数码架构和标准。

创科局回应记者关于香港智慧城市建设构想时表示,将于2016年下半年开 展一项顾问研究,为香港制定一个整体框架作为智慧城市发展蓝图,研究范围包括 0年的智慧城市长远发展计划,利用创新及科技解决面对的都市 提升城市管理和改善市民生活质量。顾问报告预计于明年4月完成。

BDI pursue to bring positive influence to the community and lead the tread in top technology field

2018年4月13日 星期五

hket



與科大成立人工智能實驗室 Never及LINE出資246萬元間科大成

服業項目

立人工智能實驗室,私大將開展體 天機械人、中文人工智能助理、客

资料來源:綜合受訪者及本報資料省

World Experts in Big Data and Artificial Intelligence Gather at HKUST to Share **Insights into Future**

26-05-2017

港科大聯手微信建「智能實驗室」

Lab on Artificial Intelligence

楊強介紹,香港科技大學在人工智能,機器人和大數據領域在世界上都是處於

深耕於學術界,希望由此開始打開兩地在人工智能領域的合作

得多項世界比賽冠軍,包括ACM KDDCUP大賽.

大學雲集國際著名協會的院士,包括幾十名IEEE Fellow。

15年國際人工智能大會的主度。以及IFFF大數據期刊的創始主義

Technology

key role of HKUST's research in these fields.

The Big Data Institute (BDI) of the Hong Kong University of Science and Technology (HKUST) today (Friday) organized its first Big Data and AI Day, playing host to a stellar assemblage of world top academics and industry celebrities in the realm of Big Data and Artificial Intelligence (AI), sharing information and insights into the future of this trendy field.

Since the establishment of the BDI in 2016, its first Big Data and AI Day drew a learned audience of over 500

quests, including local and overseas academics, leaders in the Big Data and Al-related industries, as well as students from various tertiary institutions in Hong Kong and abroad. The overwhelming attendance attested to the



Dr Tieniu Tan. Vice Minister of the Liaison Office of the Central People's Government in HKSAR (7th from right) HKUST President Prof Tony F Chan (6th from right), Vice-President for Research and Graduate Studies Prof Nancy Ip (7th from left), Dean of Engineering Prof Tim Cheng (5th from

Dr Tieniu Tan, Vice Minister of the Liaison Office of the Central People's Government in Hong Kong, officiated at the symposium. In his keynote speech on big visual data analysis, Dr Tam said, "Hong Kong is a great place for Big Data and AI, and Big Data and AI are a great hope for Hong Kong, making the place smarter and stronger."

Delivering the opening remarks, President Chan said, "Research into Big Data and Al is one of HKUST's strategic

HKUST Becomes the First University Partner Worldwide with NAVER/LINE to Set Up AI Lab

▲南韓搜義引擎公司 Naver 及子公司 LINE,與科大合作成立人工報

能實驗室。Naver 行政總裁韓聖淑(前排右)稱,公司希望吸收全球創新

AI 意念,而科大 AI 研究獲全球認可,因而選擇與科大合作。(林宇翔攝

室,成為 Naver 全球首個與大學合作的聯合 AI 出色基礎研究成果,需擴大影響力至應用層面, Interface | · 模擬人類聯部跟5大感官 曾驗室 形容雙方合作為鏈藻。 前者主要處理語言理解·AI對話,後者 陣種,實驗室由4位激擾帶領8名舉生研 解決語音、臉孔辨識,如用戶忘記電影名 韓母公司Naver 投放246萬 究·將會開展數個項目·包括聊天機械人處理 稱·簡單向 Clova 描述電影情節·AI 便可 , 栽訪即:約昨出度開幕(後式時 相劃行程、擔任实戶服務等备备,以及由文白 社交网络已成为人工智能的一个热点。 专访微信人工智能实验室: 作者 杜小芳 发布于 2015年12月19日, 估计阅读时间: 不到一分钟 | 《讨论

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腾讯旗下微信团队和香港科技大学于11月30日宣布成立联合实验室,WeChat-

HKUST Joint Lab on Artificial Intelligence Technology, 简称: WHAT Lab。该实验室将以人工智能



BDI pursue to bring positive influence to the community and lead the tread in top technology field



HKUST BDI

Research

plications

Industrialize

scientific achievements and create long-term impact to the world **Aspire** innovation and breakthrough

Benefit the Greater Bay Area (HK / Macau / Guangdong), Greater China Region and the world

Recruit talents in academia Navigate research development



BIG DATA TO BIG DREAMS

Big data is the oil of 21st century, however, unlike the oil, its reserve grows exponentially every year

JOIN BDI, ignite your future

HKUST Big Data Institute