





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

Mission and Vision

BRAIN

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



50+ faculty

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



Line/Naver Overseas Joint Lab in the World



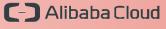


Trained 400+ BDT Master Students



Partnership with leading companies

















and more...



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





Director
Lei Chen 陳雷
Chair Professor,
Department of Computer
Science and Engineering,
HKUST



Associate Director
Yang Wang 汪揚
Vice-President for
Institutional
Advancement, HKUST



Founding Director
Qiang Yang 楊強
Chair Professor,
Department of Computer
Science and Engineering,
HKUST



Ke Yi 易珂Professor, Department of Computer Science and Engineering, HKUST



Albert Chung 鍾志成
f Associate Dean of Engineering (UG Studies) & Professor,
Department of Computer Science and Engineering, and Department of Chemical and Biological Engineering, HKUST



Shaojie Shen 沈劭劼 Associate Professor, Department of Electronic and Computer Engineering, HKUST



I-ming Hsing 邢怡銘
Head & Professor of
Department of Chemical
and Biological
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James She 許丕文 Adjunct Assistant Professor, Department of Electronic and Computer Engineering, HKUST



Chi Keung Tang 鄧智強 Professor, Department of Computer Science and Engineering, HKUST



Brian Mak 麥鑑榮 Associate Professor, Science and Engineering, HKUST



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Dimitris Papadias 白德善 Professor, Department of Computer Science and Engineering, HKUST



Bertram Shi 施毅明 Department of Computer Head & Professor, Department of Electronic and Computer Engineering, HKUST



Huamin Qu 屈華民 Professor, Department of Computer Science and Engineering, and Department of Electronic and Computer Engineering & Director, Interdisciplinary Programs Office, HKUST



Dekai Wu 吳德愷 Professor, Department of Computer Science and Engineering, HKUST



Jianfeng Cai 蔡劍鋒 Professor, Department of Mathematics, HKUST



Hong Xue 薛紅 Adjunct Professor, Division of Life Science, **HKUST**



Dit-Yan Yeung 楊瓞仁 Head & Chair Professor, Department of Computer Science and Engineering, **HKUST**



Cameron Campbell 康文林 Professor, Division of Social Science, HKUST



Hai Yang 楊海 Chair Professor, Department of Civil and Environmental Engineering, HKUST



Fugee Tsung 宗福季 Chair Professor, Department of Industrial Engineering and Decision Analytics, HKUST





Pascale Fung 馮雁 Professor, Department of Electronic and Computer Engineering & Director, Center for Artificial Intelligence Research, HKUST



Mingjie Zhang 張明傑 Adjunct Professor, Division of Life Science, **HKUST**



Jiguang Wang 王吉光 Assistant Professor, Division of Life Science, and Department of Chemical and Biological Engineering, **HKUST**



Qiong Luo 羅瓊 Associate Professor, Department of Computer Science and Engineering, HKUST



Xiaojuan Ma 麻曉娟 Assistant Professor, Department of Computer Science and Engineering, HKUST



Wei Wang 王威 Assistant Professor, Department of Computer Science and Engineering, HKUST



Weichuan Yu 余維川 Professor, Department of Electronic and Computer Engineering, HKUST





James Kwok 郭天佑 Professor, Department of Computer Science and Engineering, HKUST



Matthew McKay Kai Chen 陳凱 Professor, Department of Electronic Associate Professor, and Computer Engineering and, Department of Computer Department of Chemical and Science and Engineering, HKUST Biological Engineering, HKUST



Nevin Zhang 張連文 Professor, Department of Computer Science and Engineering, HKUST



Richard So 蘇孝宇 Associate Dean of Engineering (Research & Graduate Studies) & Professor, Department of Industrial Engineering and Decision Analytics, and Department of Chemical and Biological Engineering, HKUST



Jiheng Zhang 張季恆 Professor, Department of **Industrial Engineering and** Decision Analytics, and Department of Mathematics, HKUST



Can Yang 楊燦 Associate Professor, Department of Mathematics, HKUST



Bing-yi Jing 荊炳義 Professor, Department of Mathematics, HKUST



Raymond Wong 黃智榮 Professor, Department of Computer Science and Engineering, HKUST



Xiaoping Wang 王筱平 Head & Chair Professor, Department of Mathematics, HKUST



Xuhui Huang 黃旭輝 Professor, Department of Chemical and Biological Engineering and Department of Chemistry, HKUST



Kohei Kawaguchi 川口康平 Assistant Professor, Department of Economics, **HKUST**



Kani Chen 陳卡你 Professor, Department of Mathematics, HKUST



Professor, Department of Mathematics, HKUST

Yuan Yao 姚遠

Associate Professor, Department of

Mathematics, and Department of

Chemical and Biological

Engineering, HKUST



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



Haibin Su 蘇海斌 Associate Professor, Department of Chemistry, **HKUST**







2015 RMB ¥ 10 million Tencent





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 partnered with 神州数码

2018 HK\$ 5 million

Ying Ding Education Technology Co., Ltd





2018 HK\$ 2 million

Donation

2018 HK\$ 1 million Space Tactics Asset Management



Industrial Partners and Donation

2018

HK\$ 2.46 million

NAVER

2020 RGC-RIF Project

HK\$ 5.6 million

and more...

2019 **Xiao-i** 小i机器

OUR LABS





BDBI-Machine Learning Lab



Smart City Lab



HKUST-Ying Ding Education AI Lab



HKUST-NAVER/LINE AI 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
- ➤ 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

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.

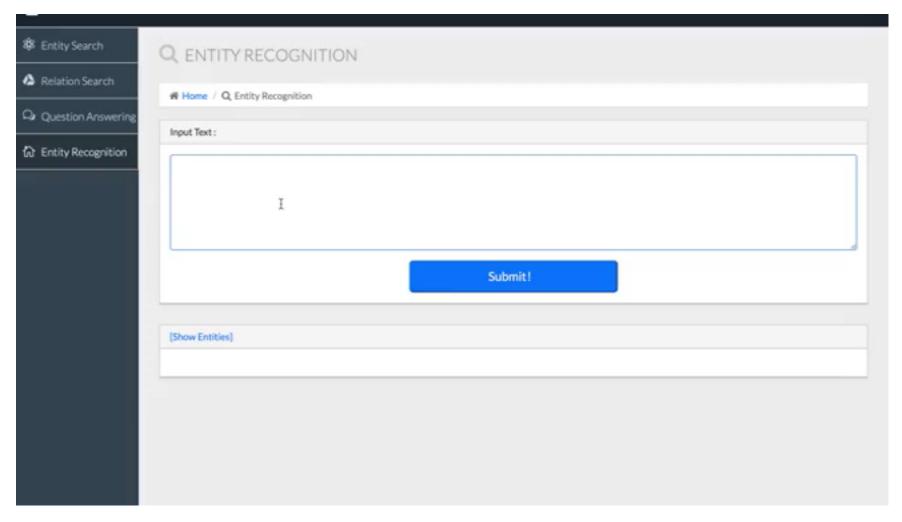
Reinforcement and transfer learning, can be used to solve the problem of dialogue system. Reinforcement learning can solve the problem of delayed feedback in multiple rounds of dialogue, while transfer learning can help target areas by using data from similar fields, which can solve the problems of traditional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



WHAT Lab

Domain Specific Knowledge Graphs

Medical Knowledge Graphs



Model-based Global Localization for Aerial Robots using Edge Alignment

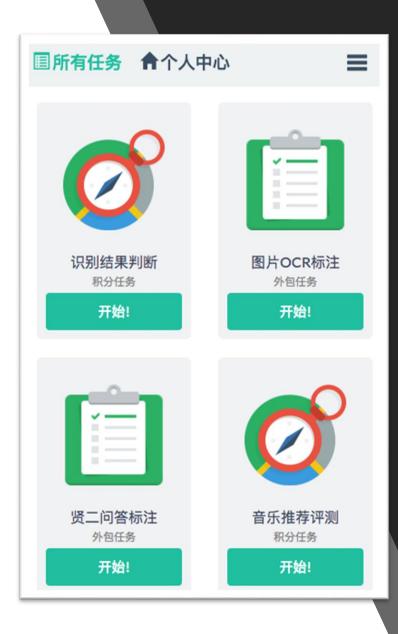
Kejie Qiu, Tianbo Liu and Shaojie Shen



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

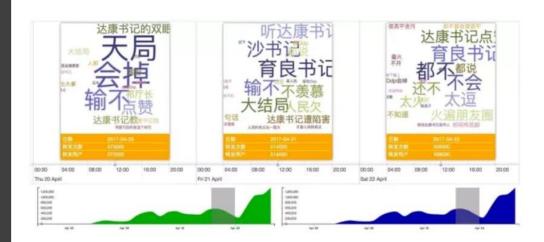


这次微信人工智能实验室 WHAT Lab 用数据可视化算法也看了一回《人民的名义》

大结局的前一周

(人民的名义) 相关热词曲线

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.



100 0 10 0000 100 L





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.



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

Smart City Lab

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.











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



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.



HKUST-Xiaoi Robot Joint Lab on Machine 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



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)

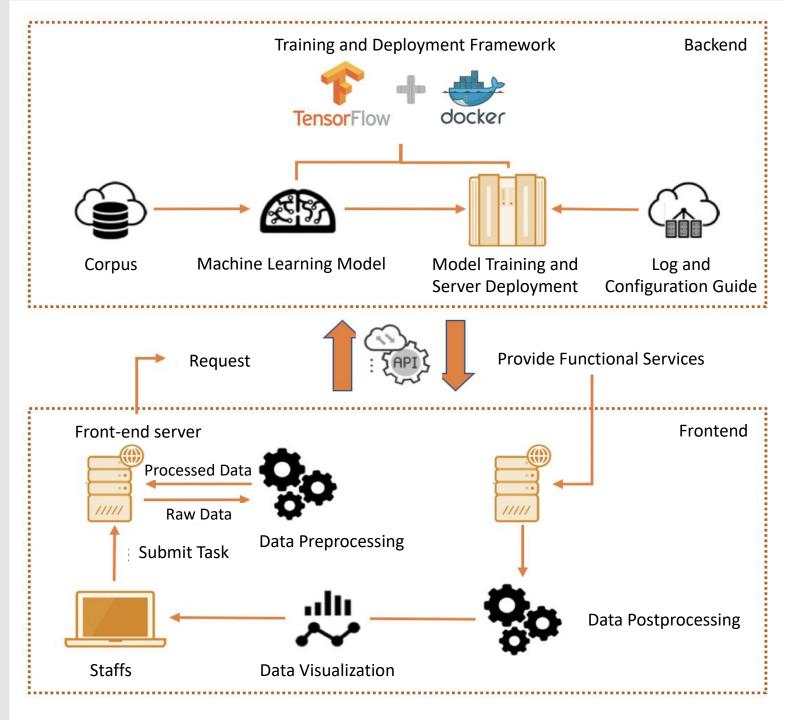




Guangdong Grid Co.

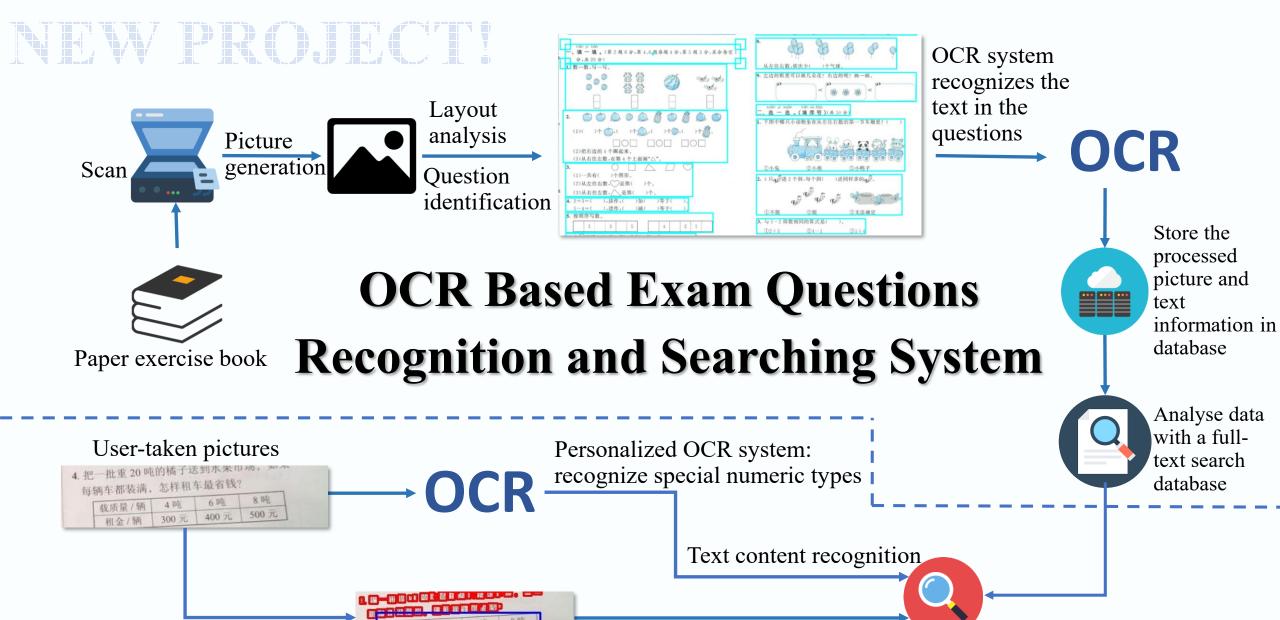
Intelligent Document Assistance System

- 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









Graphic typesetting

information

Search for similar questions

Graphic

recognition





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

科大伙內地AI龍頭研發粵語聊天機械







HKUST Signed Framework Agreement with Digital China to Build Smart City Research Institute

HKUST Establishes Laboratory on Big Data for Bio Intelligence

科大設大數據生物智能實驗室



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 強,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 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 來新見解。

大數據生物智能實驗室的研究範疇包括「深度學習 方案」,即透過豐富功能描述機器的學習問題,從而 讓電腦作出決定;以及能讓電腦模型輕易地在不同領 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

香港致力打造大数据驱动的智慧城市

2016年06月29日12:42 来源:新华社

分享至



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。

Social Impact

圖1之1 - 科大工學院院長鄭光廷(左三起)、科大副校長(研究及發展)華玉.....(林穎菌攝)

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



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

|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













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

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

26-05-2017

The Big Data Institute (BDI) of the Hong Kong University of Science and Technology (HKUST) today (Friday) organized its first Big Data and Al 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 Al 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 key role of HKUST's research in these fields.

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 AI is one of HKUST's strategic



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



港科大聯手微信建「智能實驗室」

HKUST and WeChat Establish Joint Lab on Artificial Intelligence Technology

室」,由楊強領銜。他對大公報表示,香港在AI領域有很多做機器學習、深度學習、機器翻譯的優秀

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

Social Impact

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

HKUST BDI





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

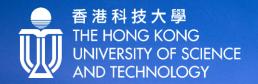
Industrialize scientific achievements and create long-term impact to the world Aspire innovation and breakthrough

BRAIN

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