

# Hong Kong PhD Fellowship Opportunities

Department of Computer Science  
Hong Kong Baptist University

# Hong Kong PhD Fellowship Scheme (HKPFS)

- **HKPFS:** The HK PhD Fellowship Scheme was established by the HK Research Grants Council (RGC) in 2009 with the aim to attract the best and brightest students in the world to pursue their PhD studies in Hong Kong's institutions
- Students from all over the world can apply

# Fellowship Award

	HKPFS during 4-year study		
	Offered by RGC	Additional Support offered by HKBU and our Department	Total Amount
Stipend (tax-free)	HK\$993,600	Additional HK\$926,400 for 4-year study subject to satisfactory performance	HK\$1,920,000
Extra Award (Elite Scholar Award)	-	HK\$80,000 (HK\$40,000 in the 1st year and HK\$20,000 in the subsequent 2 years (approx. US\$10,250))	HK\$80,000
Tuition Waiver	NA	First year tuition waiver; tuition waivers for subsequent years of study are subject to satisfactory academic progress	
Overseas Exchanges / Attachments and Research-related Activities	HK\$41,400	Plus HK\$60,000 for student's 4-year study period	HK\$101,400
Accommodation		Shared-room accommodation will be provided in the student's first year of study subject to availability	Approximate HK\$70,000

# People



29 academic faculty members with PhD degrees awarded by renowned universities in US, Canada, Australia, Singapore, Switzerland, UK, and Hong Kong

<http://www.comp.hkbu.edu.hk/v1/?page=faculty>



# Faculty Profile

- 1 ACM Fellow
- 4 IEEE Fellows
- 2 IAPR Fellows
- 1 AAAS Fellow
- 9 Top 2% Scholars by Stanford University
- Editor-in-Chief
  - [ACM Transactions on Recommender Systems](#)
  - [IEEE Transactions on Emerging Topics in Computational Intelligence](#)
- Associate Editors of various top-tier journals
  - [ACM Transactions on Interactive Intelligent Systems](#)
  - [IEEE Internet of Things Journal](#)
  - [IEEE Transactions on Cybernetics](#)
  - [IEEE Transactions on Information Forensics and Security](#)
  - [IEEE Transactions on Knowledge and Data Engineering](#)
  - [IEEE Transactions on Neural Networks and Learning Systems](#)
  - [Proceedings of the VLDB Endowment \(PVLDB\)](#)

A full list is available at: [http://www.comp.hkbu.edu.hk/v1/?page=journal\\_editorship](http://www.comp.hkbu.edu.hk/v1/?page=journal_editorship)

# Students

- **100+** research postgraduate students and research staff
- **300+** M.Sc. students
- **300+** undergraduate students





# World-class Research Facilities

## ■ GPU Clusters

- 1 GPU node with eight Nvidia Tesla A100-SXM4-40GB
- 2 GPU nodes, each with eight Nvidia Tesla A100-80G
- 4 GPU nodes, each with two Nvidia Ampere A100-80G
- 2 GPU nodes, each with two Nvidia Ampere A100-40G
- 14 GPU nodes, each with four Nvidia Tesla V100
- 1 AI node with eight Ascend 9100 NPU-32G



## ■ Big Data Cluster

- Hadoop + Spark
- 5 dual-Xeon servers with 120TB of storage

## ■ Research Cluster

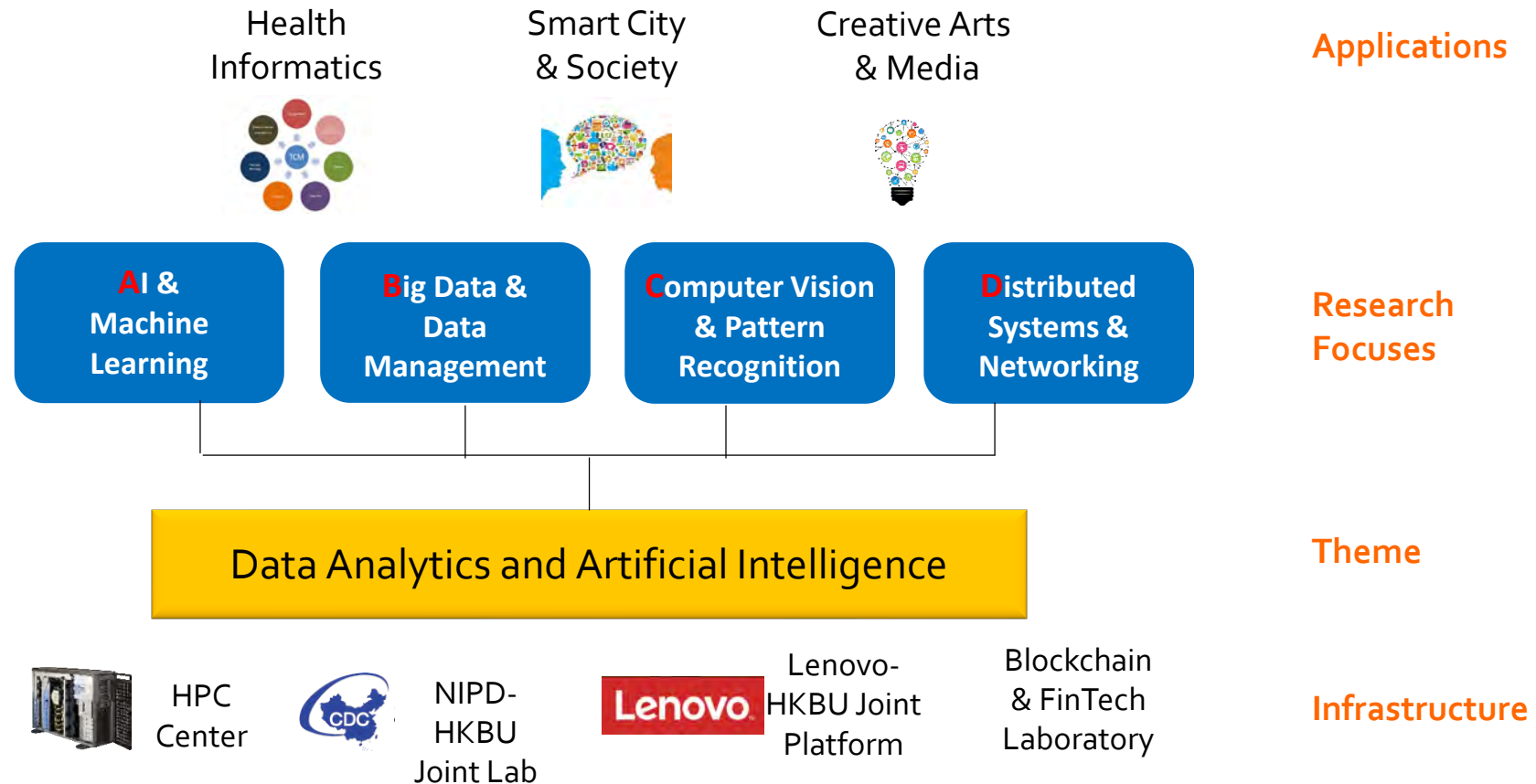
- More than 26 dual-Xeon and 6 dual-AMD EPYC servers
- Attached with 1PB storage system

## ■ Top-500 Supercomputer (256 nodes)

- Under the Science Faculty



# Four Major Research Focuses





# Research Outputs

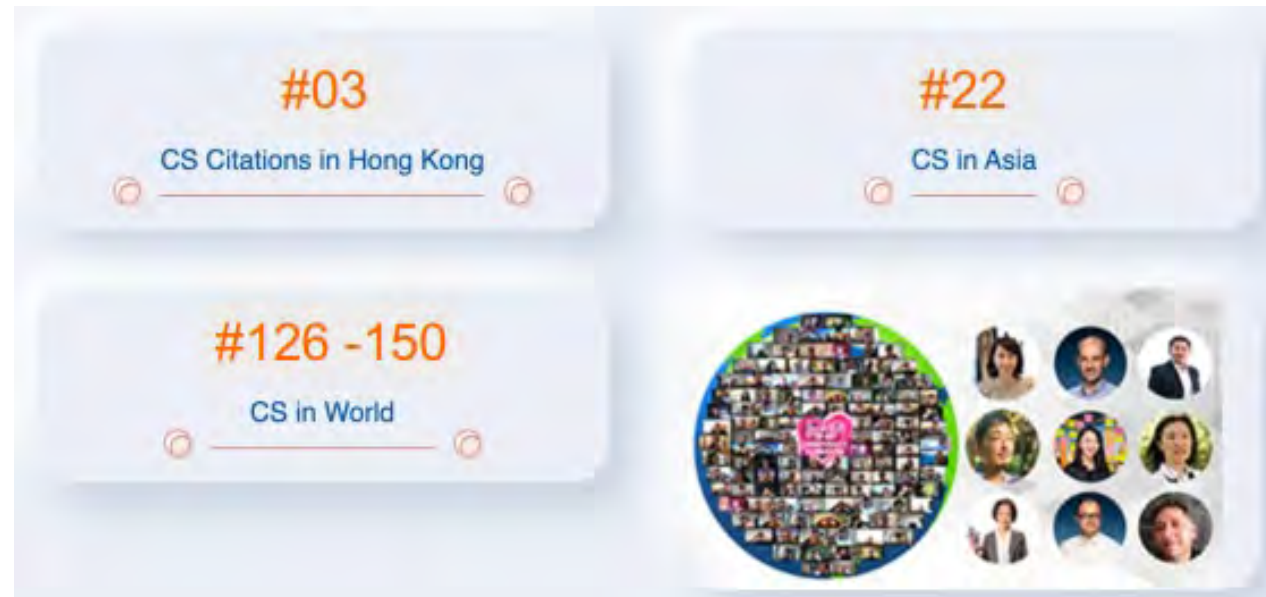
## #1 Research Outputs



Sector-wide / university	Quality profile & sub-profiles	Percentage judged to meet the standard of :				u/c	<div> <div>4*</div> <div>3*</div> <div>2*</div> <div>1*</div> <div>u/c</div> </div>				
		4*	3*	2*	1*		4*	3*	2*	1*	u/c
Hong Kong Baptist University	Overall	35	60	5	0	0					
	Outputs	45	51	4	0	0					
	Impact	0	100	0	0	0					
	Environment	25	63	12	0	0					

- **4-Star**: world leading
- **3-Star**: internationally excellent
- **2-Star**: internationally standing
- **1-Star**: regional standing

# Subject Ranking



Source: [\*THE World University Rankings 2022\*](#)

# Subject Ranking

## CSRankings



Source: [CSRankings](#)

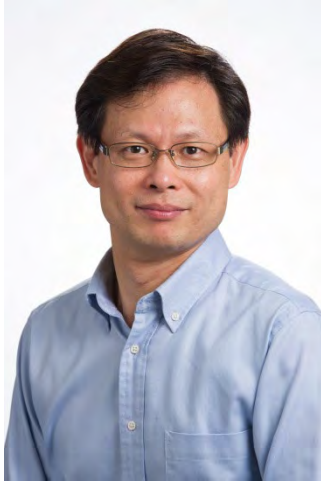
# Artificial Intelligence and Machine Learning (AIML)

Artificial Intelligence; Machine Learning

Big Data Analytics; Data Mining

Intelligent User Interface; Autonomy-Oriented Computing; Web Intelligence

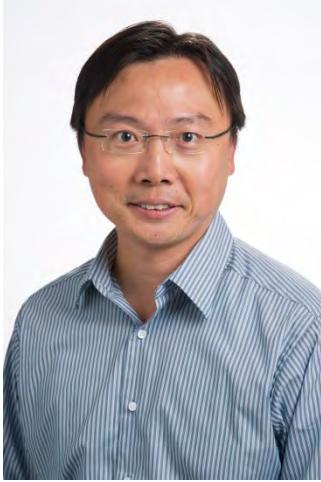
# Faculty members (AIML)



**Prof. Jiming Liu**

- Chair Professor
- IEEE Fellow
- Editor-in-Chief
  - Web Intelligence (IOS Press, The Netherlands)
  - Brain Informatics (Springer)
- Associate Editor
  - IEEE Transactions on Knowledge and Data Engineering
  - IEEE Transactions on Cybernetics
  - Computational Intelligence
- Chair of IEEE Computer Society Technical Committee on Intelligent Informatics
- Co-Founder/Co-Chair of Web Intelligence Consortium (WIC) with Centres in over 20 countries

# Faculty members (AIML)



**Prof. William Cheung**

- Programme Co-chairs and PC Members
  - A number of IEEE/ACM international conferences/workshops on Data Mining, Artificial Intelligence, Web Intelligence, Health Informatics and E-commerce
- Managing Editor
  - IEEE Intelligent Informatics Bulletin
- Track Editor (Network Science)
  - Web Intelligence Journal (IOS Press, The Netherlands)
- Guest Editor
  - Computational Intelligence *An International Journal (Special Issue on Knowledge Grid and Grid Intelligence)*
  - Journal of E-Commerce Research and Applications *(Special Issue on Intelligence in e-Application)*
  - International Journal of Web Services Research *(Special Issue on Services Discovery and Composition Systems)*
- Director of Centre for Health Informatics

# Faculty members (AIML)



**Prof. Li Chen**

<https://www.comp.hkbu.edu.hk/~lichen/>

- Associate Head (Research) and Professor
- Google Scholar profile:
  - h-index 46, i10-index 96, citations 9,336
- Education:
  - PhD degree in Computer Science, **Swiss Federal Institute of Technology in Lausanne (EPFL)**, Switzerland
  - Bachelor and master degrees, **Peking University**, China
- Professional activities:
  - **Co-Editor-in-Chief**, ACM Transactions on Recommender Systems (TORS), since 2022
  - **Associate Editor**, ACM Transactions on Interactive Intelligent Systems (TiiS)
  - **Editorial Board Member**, User Modeling and User-Adapted Interaction: The Journal of Personalization Research (UMUAI)
- Research interests:
  - Conversational AI, Explainable AI, Recommender Systems, Human-Computer Interaction



# Faculty members (AIML)



**Dr. Yifan Chen**

Homepage:

[ychen-stat-ml.github.io](https://ychen-stat-ml.github.io)

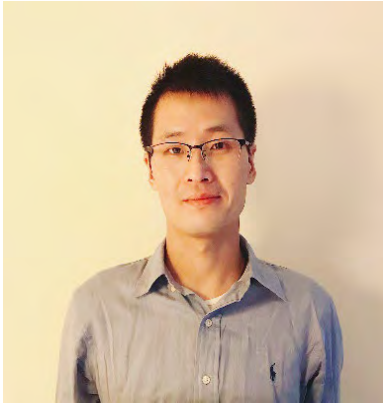
Admission Info:

[zhuanlan.zhihu.com/p/651070296](https://zhuanlan.zhihu.com/p/651070296)



- **Assistant Professor**
  - PhD (University of Illinois Urbana-Champaign, 2023)
- **Research interests**
  - Computation in Machine Learning (Transformers, GNNs)
  - Nonparametric Statistics
  - Optimal Transport
- **Outcomes with Junior Student Collaborators**
  - NeurIPS, ICML, TMLR
- **Collaborators from**
  - UIUC, USC, Duke, CityU
  - Microsoft, IBM, Amazon, ByteDance, SF Express
- **Professional Services:**
  - Program Committee: ICML, NeurIPS, AISTATS, AAAI, etc.
  - Journal Reviewer: TIT, JMLR, JASA, etc.

# Faculty members (AIML)



**Dr. Han Bo**

- Assistant Professor
- BAIHO Visiting Scientist of RIKEN AIP (with Prof. Sugiyama's Team)
- Top 10 Highly-cited Papers in NeurIPS'18 (Co-teaching)
- Monograph accepted by MIT Press (Machine Learning with Noisy Labels)
- RGC Early Career Scheme and NSFC Young Scientists Fund
- MSRA StarTrack Program and Tencent AI Lab Focused Research Award
- Area Chairs of NeurIPS, ICML and ICLR
- Action Editor of TMLR; Guest Editor of MLJ; Editorial Board of JMLR
- ICLR'21 Outstanding Area Chairs and ICML'20 Top Reviewers

Homepage: <https://bhanml.github.io/>

Google Scholar: <https://scholar.google.com.au/citations?user=nTNjqHwAAAAJ>

Recruiting Information: [https://bhanml.github.io/prospective\\_students.pdf](https://bhanml.github.io/prospective_students.pdf)

# Faculty members (AIML)



**Dr. Liu Yang**

- Assistant Professor
  - B.Eng. and M.Eng. (National University of Defense Technology, 2004 and 2007)
  - Ph.D. (Hong Kong Polytechnic University, 2011)
  - Visiting scholar (Carnegie Mellon University, 2010)
  - Postdoc (Yale University, 2011-2012)
- Research Interests
  - Artificial Intelligence, Machine Learning
  - Computational Epidemiology, Infectious Disease Modeling
- Publications
  - Lancet's EClinicalMedicine, T-NNLS, T-Cyber, T-IP, T-AC, T-AMD, T-IST, PR, Neurolmage, etc.
  - AAAI, IJCAI, SIGIR, ACMMM, etc.
- Expected qualification of students:
  - Solid mathematical background
  - Familiar with Matlab, C/C++, Java, or Python
  - Personality traits: Proactive; self-motivated; strong planning, critical thinking, problem solving, effective time management skills; and the ability to multitask

# Faculty members (AIML)



**Dr. Lu Zhang**

**Email:**

[ericluzhang@comp.hkbu.edu.hk](mailto:ericluzhang@comp.hkbu.edu.hk)

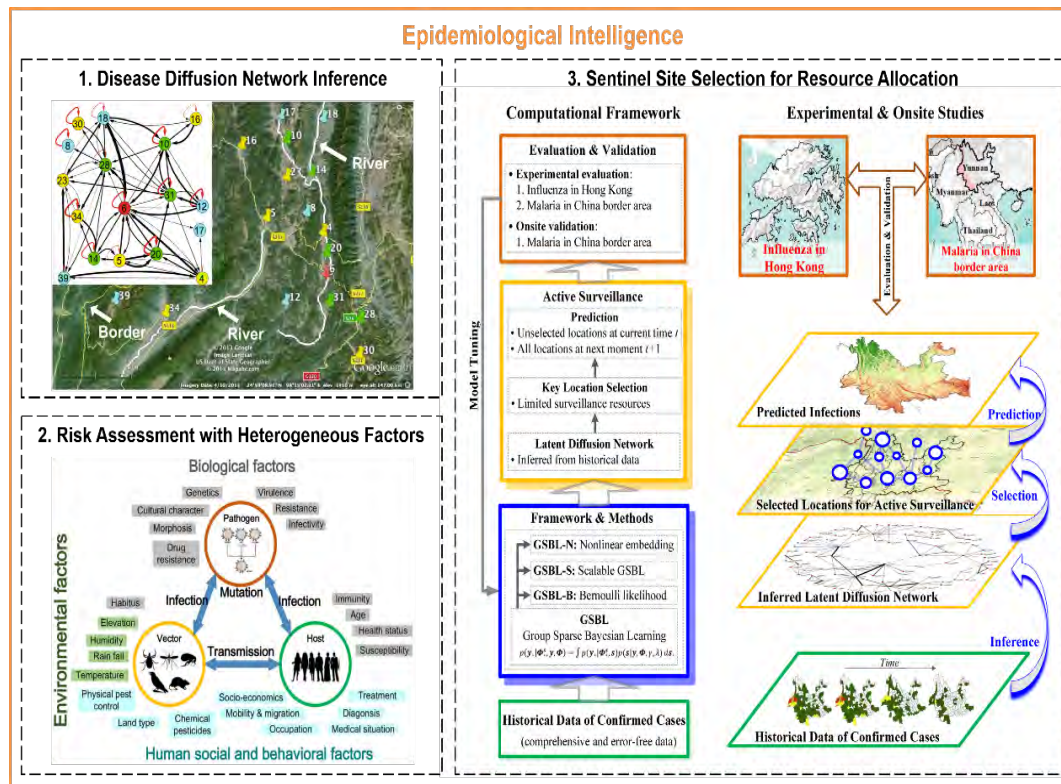
**Webpage:**

<https://www.comp.hkbu.edu.hk/~ericluzhang/>

- Assistant Professor :
  - B.E. Software engineering, Tianjin University
  - MPhil Bioinformatics, The University of Hong Kong
  - PhD Computer Science, City University of Hong Kong
  - Postdoc, Computer Science, Stanford University
  - Visiting Student, Mathematics, UC Berkeley
  - Honor Research Officer, Imperial College London
- Collaborators:
  - Stanford University, UC Berkeley, Vanderbilt University, BGI, etc.
- Publications :
  - Briefings in Bioinformatics, Bioinformatics, Nature Communications, PNAS, et al.
- Research Interests:
  - AI in drug discovery (small molecule, Aptamer, Chinese Medicine)
  - AI in genomics (use deep learning to decipher the genome of viruses and bacterial)

# Machine Learning for Combating Diseases: From Theories to Impacts

(Jiming Liu, Yang Liu, et al.)



## Novel ML framework design

- Heterogeneous source integration; multi-scale dependency characterization; etc.

## Theoretical formulation and mathematical proof

- Configuration determination; convergence analysis; error bound guarantee; etc.

## Systematic validation and deployment

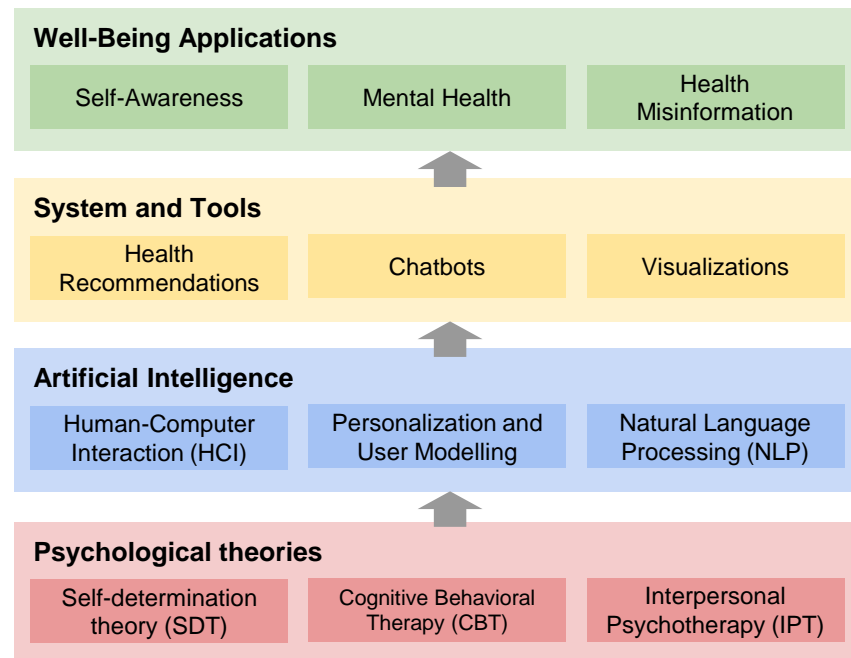
- Theoretically derived ML behavior characterization
- Validation on publicly available datasets
- **Impacts:** disease transmission modeling, risk assessment, healthcare resource allocation, etc.



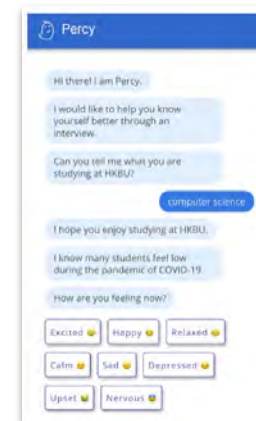
# Empathetic and Personalized Conversational AI for Promoting Human Well-Being

(Li Chen, Yucheng Jin, et al.)

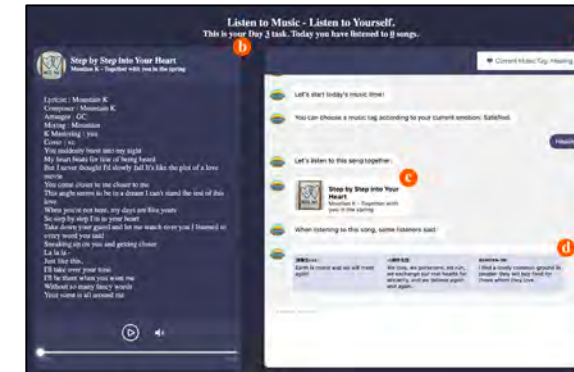
📍 We aim to develop a **broadly accessible AI-empowered solution to promote people's psychological well-being**. We will base our long-term research experiences on the areas of artificial intelligence, psychology, and digital communication to develop empathetic and personalized conversation systems for this goal.



**Self-Awareness**  
*Keeping track of the users' mood through friendly and casual chats for increasing their self-awareness.*



**Mental Health**  
*Mitigating users' loneliness, lack of meaning, and stress by providing in-time, personalized service and support.*



**Health Misinformation**  
*Enabling the mixed-initiative fact-checking for health information.*

# Efficient Machine Learning via Matrix Approximation

(Yifan Chen et al.)

- **Outcomes with Junior Student Collaborators**

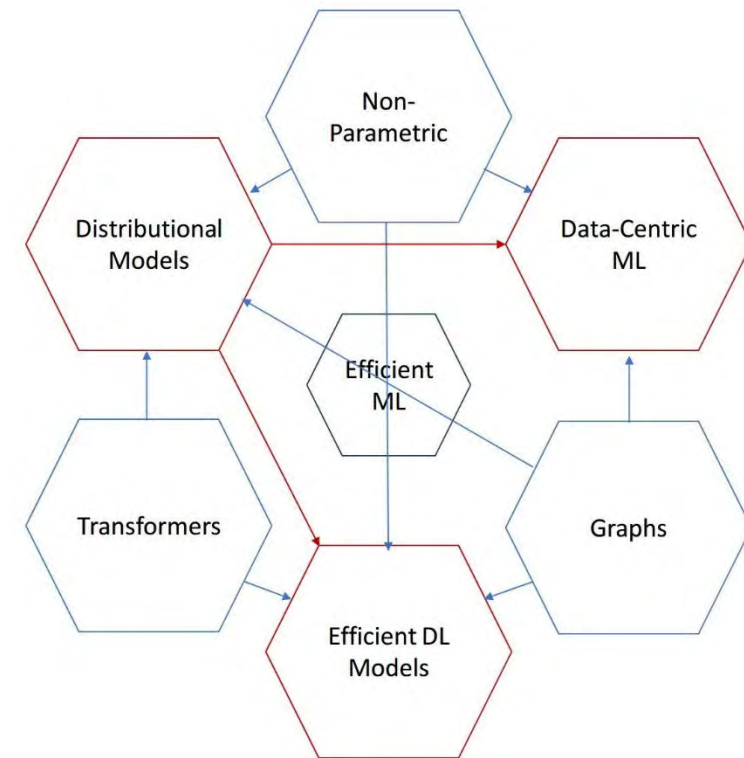
- NeurIPS (Transformers, Efficient DL Models)
- ICML (Transformers, Graphs)
- TMLR (Graphs)

- **Collaborators from**

- UIUC, USC, Duke, CityU
- Microsoft, IBM, Amazon , ByteDance, SF Express

- **Mentoring Styles**

- 1-on-1 weekly meeting & discussion on Slack
- Hands-on in first two years (from idea to writing)
- Help to connect
  - collaboration with other researchers
  - research intern / visiting students
  - attend ml conferences once even without pubs
- Encourage qualified students to graduate early (3 years)



Homepage: [ychen-stat-ml.github.io](https://ychen-stat-ml.github.io)

Admission Info: [zhuanlan.zhihu.com/p/651070296](https://zhuanlan.zhihu.com/p/651070296)



# Towards Trustworthy Learning and Reasoning with Noisy Data

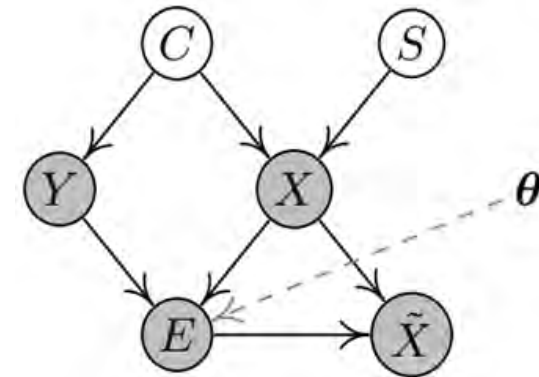
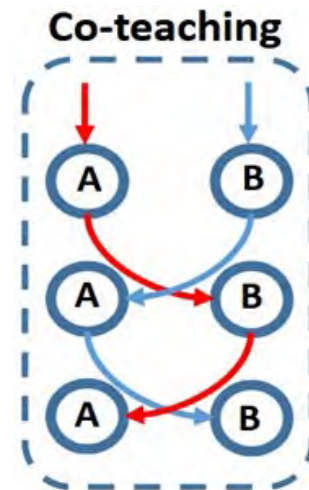
(Bo Han et al.)

## Collaborators:

- RIKEN AIP & MPI EI
- CMU & UT Austin
- USYD & UNIMELB

## Cultivation:

- Hands-on in first two years
- Hands-off for internships
- Group & 1-on-1 meeting



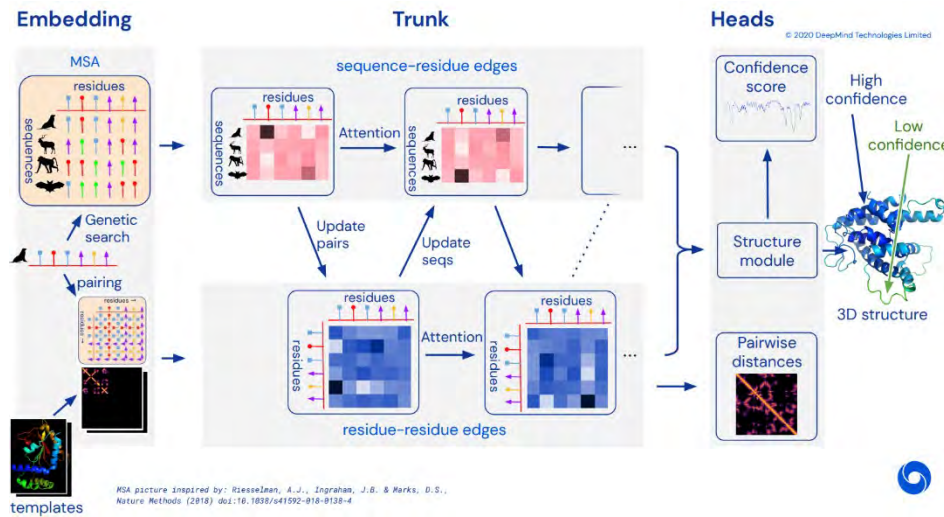
Research: <https://bhanml.github.io/research.html>

Contact: with title "Prospective students and visitors" via [bhanml@comp.hkbu.edu.hk](mailto:bhanml@comp.hkbu.edu.hk)

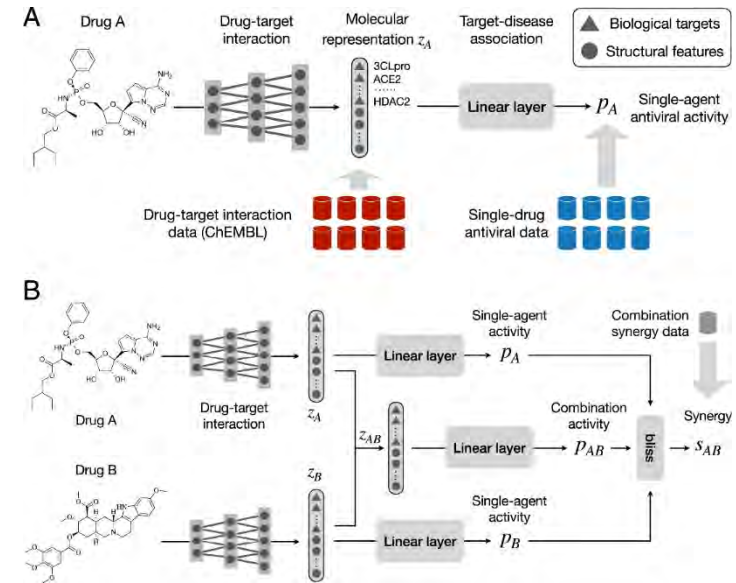
# Artificial Intelligence in Big Data and Drug Discovery

(Lu Zhang)

## Breakthrough of AlphaFold 2



## Drug combination for COVID-19



**Challenge:** Discovering new drug targets and different types of drugs using the deep learning techniques in **natural language processing** or **computer vision**.

**Methodology:** Generative model, multi-source data integration, transformer et al.

# Big Data Analytics and Management (BDAM)

Data Analytics; Graph/social/spatial data management; Blockchain

Databases; Query Processing

Data Privacy and Security

Natural Language Processing

# Faculty members (BDAM)



**Prof. Jianliang Xu**

- **Associate Editor of SCI Journals**
  - IEEE Transactions on Knowledge and Data Engineering (TKDE)
  - Proceedings of VLDB (PVLDB)
  - International Journal of Information Science and Engineering (JISE)
  - International Journal of Distributed Sensor Networks (IJDSN)
- **Review Board Member**
  - Proceedings of VLDB (2018-2021)
- **Chair of Major International Conferences**
  - General Co-Chair, IEEE MDM 2022
  - Program Committee Co-Chair, IEEE BlockDM 2021
  - Program Committee Co-Chair, IEEE MDM 2019
  - Program Committee Co-Chair, NDBC 2019
- **TPC Member of Top International Conferences**
  - SIGMOD, VLDB, ICDE, WWW, etc.

# Faculty members (BDAM)



**Prof. Byron Choi**

- **PhD (University of Pennsylvania, USA, 2006)**
- **Previous work experience**
  - University of Edinburgh (UK)
  - Nanyang Technological University (SG)
- **Research interests:** graph queries, database securities, time series analysis
- **On-going projects:**
  - GRF: Semantic Indexing for Keyword Search on Graphs (HKBU12201119, 2020)
  - RIF: Exploring the role of big data analytics (BDA) in promoting smart low-carbon cities: A human-centered, community-based, and deep engagement approach in HK
- **Professional services**
  - Director of Croucher Advanced Study Institute on “Frontiers in Big Data Graph Research” 2015
  - Program committee: SIGMOD `24-`23, EDBT `23 (senior), PVLDB `22-`21, ICDE `22, CIKM `21 (senior)
  - Information Director of SIGMOD (including sigmod.org and DBWorld)

# Faculty members (BDAM)



**Dr. Xin Huang**

- Associate Professor
  - B.Eng. (Xiamen University, 2010)
  - Ph.D. (The Chinese University of Hong Kong, 2014)
- PC Members: VLDB, ICDE, KDD, WWW, AAAI, IJCAI, CIKM.
- Supervised student achievements
  - Best Paper Nomination, ACM CIKM 2020
  - Best Paper Award, WISE 2019
  - Best Student Paper Award, IEEE ICSC 2017
- Expected qualification of students:
  - **Solid** in mathematics, data structure, and algorithm
  - ICPC programming experience is a **plus**
  - Interested in writing codes that run **fast** on big data

# Faculty members (BDAM)



**Dr. Ma Jing**

**Assistant Professor**

*[2020.04--now]*

**Email:**

[majing@hkbu.edu.hk](mailto:majing@hkbu.edu.hk)

**Webpage:**

<https://majingcuhk.github.io/>

- **PhD (The Chinese University of Hong Kong, 2020)**
- **Previous work experience**
  - Nanyang Technological University (Visiting Scholar) 2018,12 – 2019,08
  - Institute for Basic Science (Visiting Scholar) 2019.12 – 2020.02
- **Research interests:**
  - Natural language Processing
  - Information Verification: Fake News Detection, Rumor Detection, etc.
  - Opinion mining, stance detection
  - Social Network analytics
  - Explainable Machine Learning
  - Question and Answering, Dialog System
- **Conference/Workshop services**
  - More than 30 publications in refereed journals, conferences and workshops, including ACL, WWW, EMNLP, IJCAI, CIKM, TKDE and TIST.
  - Program Committee Member: WSDM 2023, EACL 2023, AACL 2022, WWW 2021 2023, CIKM 2020, AAI 2019-2022, ACL 2019, EMNLP 2018-2019, AI 2019, etc
  - Journal Reviewer: TKDE, TOMM, TIST, TNNLS, PLOS ONE, etc



# Faculty members (BDAM)

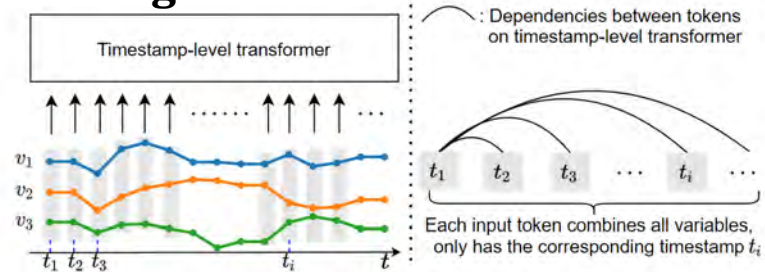


**Dr. Renchi Yang**

- **Assistant Professor**
  - PhD (Nanyang Technological University, 2021)
  - B.Eng. (Beijing University of Posts & Telecommunications, 2015)
- **Previous work experience**
  - National University of Singapore (SG)
- **Research interests:** graph query processing, web search, social network analysis, graph representation learning, etc.
- **Research Recognition:**
  - Best Paper Award Nominee in WWW 2022
  - 2022 ACM SIGMOD Research Highlight Award
  - Best Research Paper Award in VLDB 2021
- **Conference/Workshop services**
  - Program committee: KDD 2022-2023, WWW 2022-2023, WSDM 2023, ECML-PKDD 2022, etc.

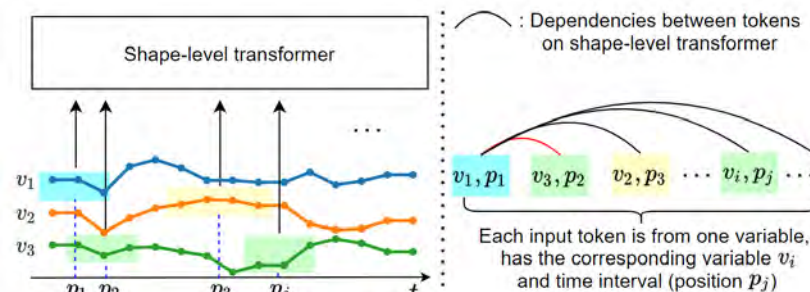
# Shape-level Variable-Position Transformer for Multivariate Time Series Classification [AAAI'23] (Byron Choi)

## Existing work



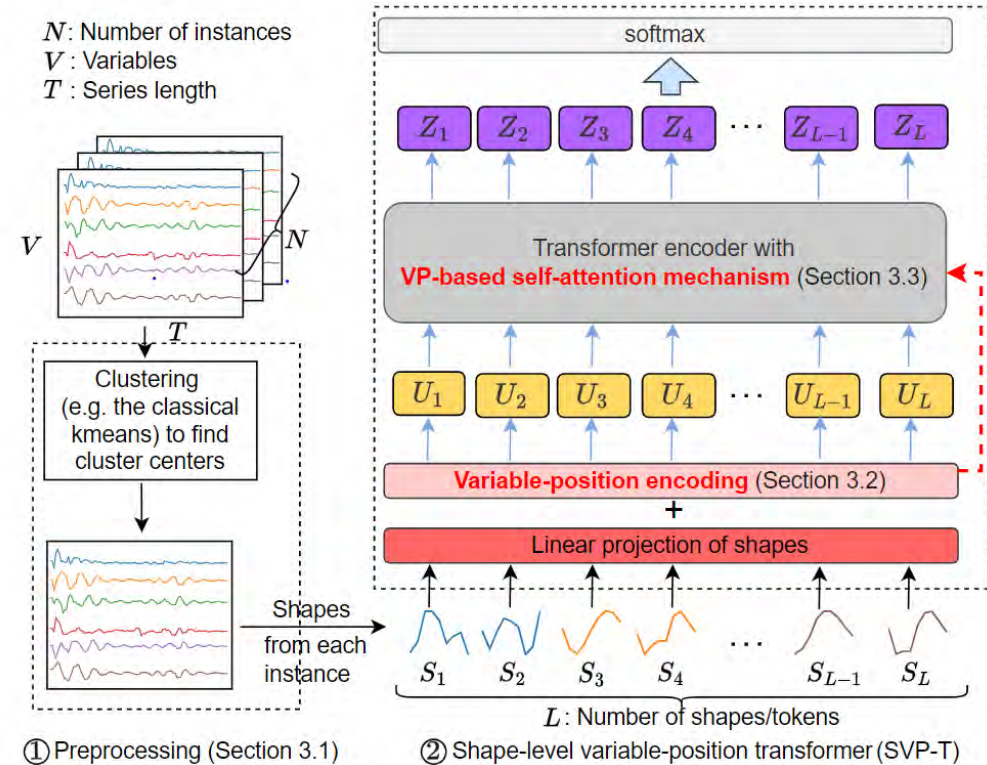
(a) LHS: the timestamp-level transformer; RHS: the dependencies (lines) of all tokens (timestamps) to first token learned by the transformer. The input token of timestamp-level transformer combines all variables at one timestamp, the transformer only captures the temporal dependencies.

## Our ideas



(b) LHS: the shape-level transformer; RHS: the dependencies (lines) of all tokens (shapes) to first token learned by the transformer. The input token of shape-level transformer is from one variable  $v_i$  with the corresponding time interval (position  $p_j$ ). By capturing the dependencies between shapes, the dependencies of variables and positions are learned. The red line denotes the dependencies between  $v_1$  and  $v_3$ .

## Overview of our transformer (Novelties highlighted in red)



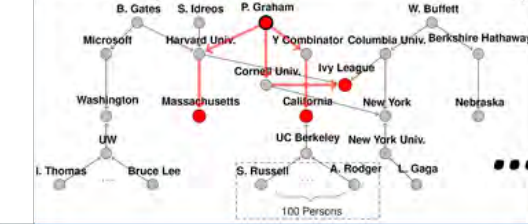
# Semantic Indexing for Keyword Search on Graphs

(HKRGC GRF HKBU12201119)

(Byron Choi)

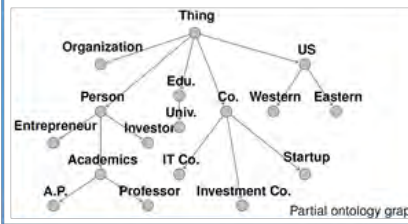
## Database research 1: Query performance [1]

1. Data: Resourceful knowledge graphs  
(millions of nodes and tens millions of edges)

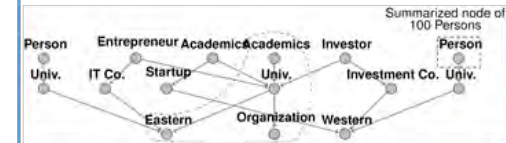


**Keyword search example :** { Massachusetts, Ivy League, California} at “Paul Graham”

2. Well annotated with ontology (semantic) info



### 3. Indexing knowledge with semantics



The size is roughly reduced to less than half!  
Keyword search times are significantly reduced.

## Database research 2: Novel applications – public-private social networks [2]

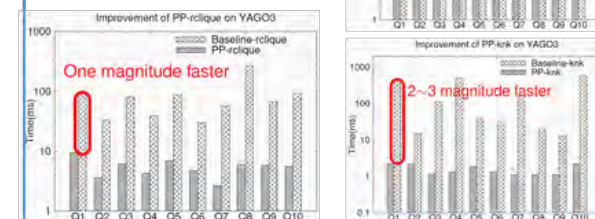
### 1. Public social network



## 2. Private network within a company



3. Performance in i) various models + ii) various search semantics



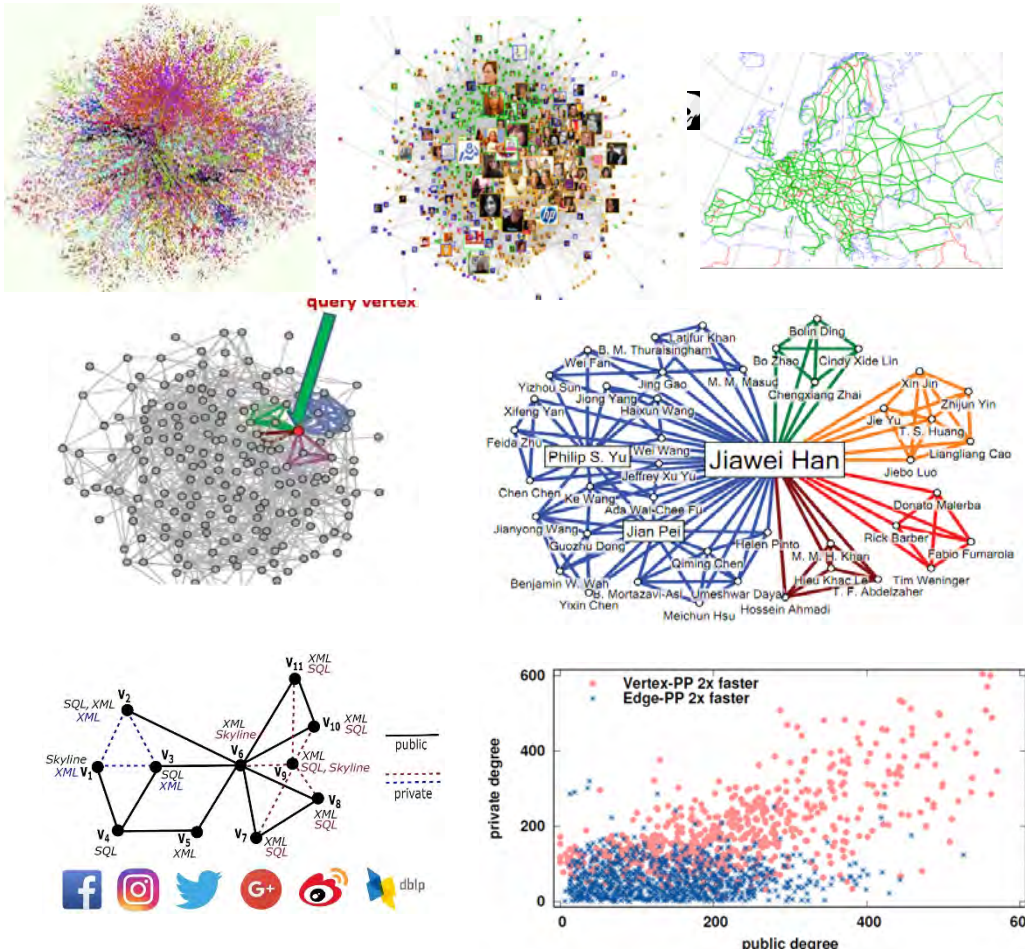
**Sample publications by a recent PhD graduate J. Jiang:**

- [1] J. Jiang et al. A Generic Ontology Framework for Indexing Keyword Search on Massive Graphs. IEEE TKDE, 2019.
- [2] J. Jiang et al. PPKWS: An Efficient Framework for Keyword Search on Public-Private Networks. IEEE ICDE, 2020



# Large-scale Graph Data Management, Mining, and Learning (Xin Huang et al.)

## ■ Big Graph Data



- Graph Data Management
  - Graph Indexing, Graph Query Processing, Keyword Search
- Graph Mining
  - Community Search, Graph Decomposition, Graph Summarization, Graph Visualization
- Graph Learning
  - Graph Embedding, GCN
- Social Network Analysis
  - Public-Private Graph Analytics

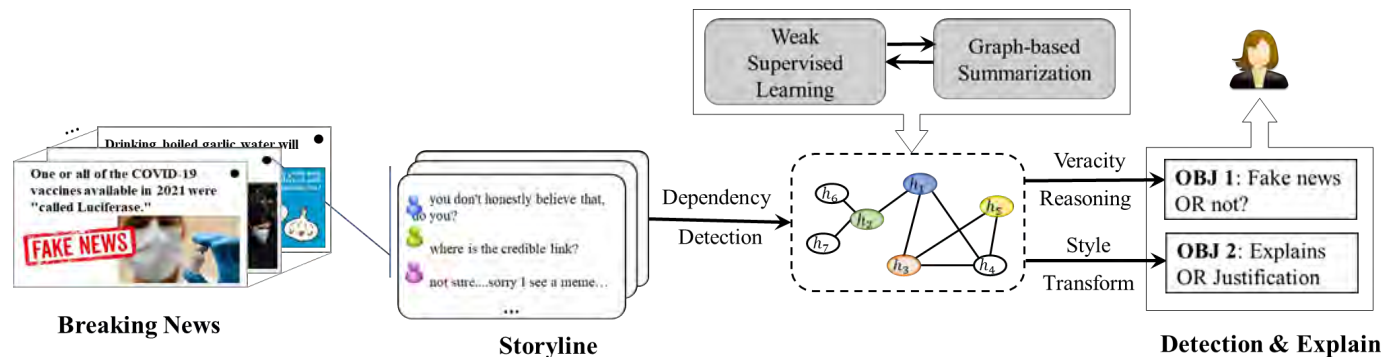
# AI for Information Verification and Retrieval (Ma Jing et al.)

## ■ Explainable Fake News Detection:

- Verify Truthfulness and generate justifications to explain.
- Weakly-supervised evidence retrieval

## ■ Question & Answering:

- Questions to find truth for a dubious statement;
- Retrieve & generate credible answers from the crowd of wisdom



## ■ Low-resource Rumor Detection:

- Domain Adaption
- Multi-language alignment

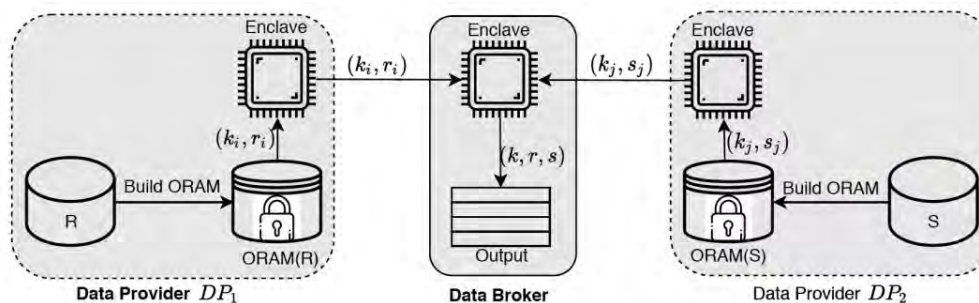
## ■ Explainable AI Model:

- Explain pre-trained language model
- Image-text retrieval

# Responsible Big Data and Blockchain Technologies

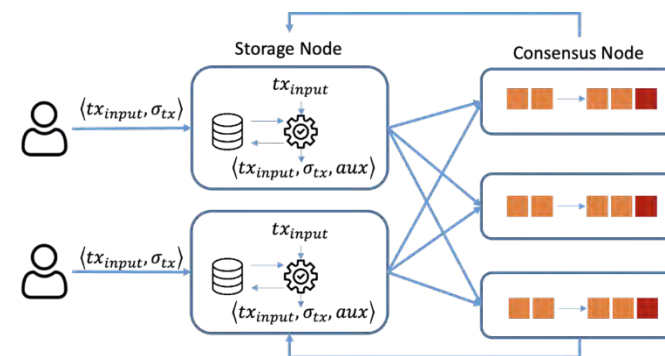
(Jianliang Xu et al.)

- **Federated analytics:** enabling collaborative analytics on decentralized sensitive data without invading privacy
- **Challenge:** susceptible to side-channel attacks
- **Solution:** *oblivious* and *efficient* index-based data access and query processing



Federated Data Analytics  
with Hardware Enclaves

- **Stateless blockchain**
  - Move **states** and **transactions** to off-chain nodes
  - Maintain only **small digests** on chain
  - Execute transactions by off-chain nodes, and verified and committed by consensus nodes

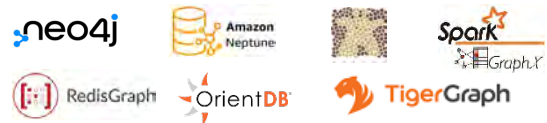
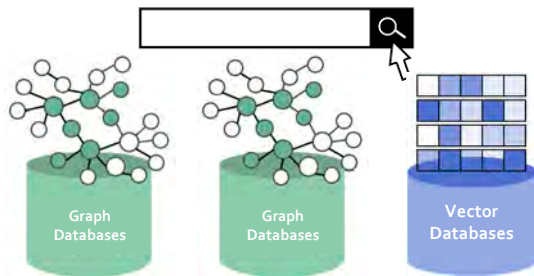


Stateless Blockchain

# Efficient and Effective Big Graph Data Science (Renchi Yang et al.)

## Graph Data Management

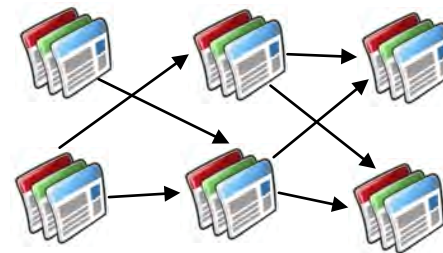
- Graph Query Processing
- Graph Storage & Indexing
- Graph Visualization



Sampling, Indexing, Pruning  
GPU computing, Distributed computing

## Web Search & Mining

- Search & Ranking
- Combating Web Spam
- Query Analysis, etc.



Graph theory, Network Embedding,  
Graph Neural Networks, etc.

## Social Network Analysis

- Community Detection
- Anomaly Detection
- Recommendations, etc.





# Computer Vision and Pattern Recognition (CVPR)

Computer Vision; Facial Recognition

Biometric System Security

Medical Informatics; Medical Image Processing

Intelligent Video Surveillance

Computational Photography

# Faculty members (CVPR)



**Prof. Pong Chi Yuen**

- Chair Professor
- Associate Editor: IEEE Transactions on Information Forensics and Security
- Editorial Board Member: Pattern Recognition
- HK Research Grants Council (RGC) Engineering Panel member
- Advisory Board
  - IEEE Seventh International Conference on Biometrics: Theory, Applications And Systems (BTAS), 2015
- Program Co-chair
  - International Conference on Pattern Recognition (ICPR), 2006
  - IEEE Fifth International Conference on Biometrics: Theory, Applications And Systems (BTAS), 2012
- Director of Croucher Advanced Study Institute on Biometrics 2004 and 2007
- IAPR Fellow

# Faculty members (CVPR)

Always looking for strong applicants for PhD students!



**Prof. Yiu Ming Cheung**

E-mail: [ymc@comp.hkbu.edu.hk](mailto:ymc@comp.hkbu.edu.hk)  
Tel.: (+852) 3411 5155

<https://www.comp.hkbu.edu.hk/~ymc/>

- PhD, FIEEE, FAAAS, FIET, FBCS
- Chair Professor in Artificial Intelligence, Department of Computer Science, HKBU
- Changjiang Scholars (Chair Professor)
- Ranked the World's Top 1% Most-cited Scientists in the field of Artificial Intelligence and Image Processing by Stanford University (2020-2022)
  
- **Research Interests:**
  - Machine Learning
  - Visual Computing
  - Data Science
  - Pattern Recognition
  - Multi-objective Optimization
  - Information Security
  
- **Selected Publications (Within the Past Three Years):**
  - M.K. Li, **Y.M. Cheung\*** and Z.K. Hu, "Key Point Sensitive Loss for Long-tailed Visual Recognition", IEEE Transactions on Pattern Analysis and Machine Intelligence, in press, DOI: 10.1109/TPAMI.2022.3196044.
  - Y.Q. Zhang and **Y.M. Cheung\***, "Learnable Weighting of Intra-attribute Distances for Categorical Data Clustering with Nominal and Ordinal Attributes", IEEE Transactions on Pattern Analysis and Machine Intelligence, 44(7): 3560-3576, 2022.
  - X. Liu, K. Hu, H.B. Ling and **Y.M. Cheung\***, "MTFH: A Matrix Tri-Factorization Hashing Framework for Efficient Cross-Modal Retrieval", IEEE Transactions on Pattern Analysis and Machine Intelligence, 43(3): 964-981, 2021.
  - Y. Zhou and **Y.M. Cheung\***, "Bayesian Low-Tubal-Rank Robust Tensor Factorization with Multi-Rank Determination", IEEE Transactions on Pattern Analysis and Machine Intelligence, 43(1): 62-76, 2021.
  - Y. Lu, **Y.M. Cheung\*** and Y.Y. Tang, "Bayes Imbalance Impact Index: A Measure of Class Imbalanced Dataset for Classification Problem", IEEE Transactions on Neural Networks and Learning Systems, 31(9): 3525-3539, 2020.
  - **Y.M. Cheung\***, F.Q. Gu, H.L. Liu, K.C. Tan and H. Huang, "Objective-Domain Dual Decomposition: An Effective Approach to Optimizing Partial Differentiable Objective Functions", IEEE Transactions on Cybernetics, 50(3): 923-934, 2020.

# Faculty members (CVPR)



**Dr. Jie Chen**

- Assistant Professor, Department of Computer Science, HKBU
- Research Interests



Computational Photography



3D Vision



Motion



Art Tech

- Professional Activities
  - **Associate Editor:** The Visual Computer Journal, Springer
  - **Area Chair,** ICME (IEEE International Conference on Multimedia & Expo), VCIP (IEEE International Conference on Visual Communications and Image Processing)
  - **TPC Member** for CVPR, ECCV, ICCV, ACM MM, NeurIPs, CGI (Computer Graphics International), EUSIPCO (European Signal Processing Conference)
  - **Reviewer** for IEEE TIP, TSCVT, TCI, SPL, TOB, ACM TOG

# Faculty members (CVPR)



**Dr. Renjie Wan**

- Assistant Professor
- Professional Activities
  - Area Chair, VALSE
  - Reviewer of CVPR/ICCV/ECCV/NeurIPS/AAAI/IJCAI/ICML/TIP/TPAMI/IJCV
  - Outstanding reviewer of ICCV
- Experiences
  - Assistant Professor, Department of Science, HKBU
  - Wallenberg-NTU Presidential Postdoctoral Fellow, NTU, Singapore, and Lund University, Sweden
  - PhD Nanyang Technological University, Singapore
  - BEng. University of Electronic Science and Technology of China

# Faculty members (CVPR)



**Dr. Kaiyang ZHOU**

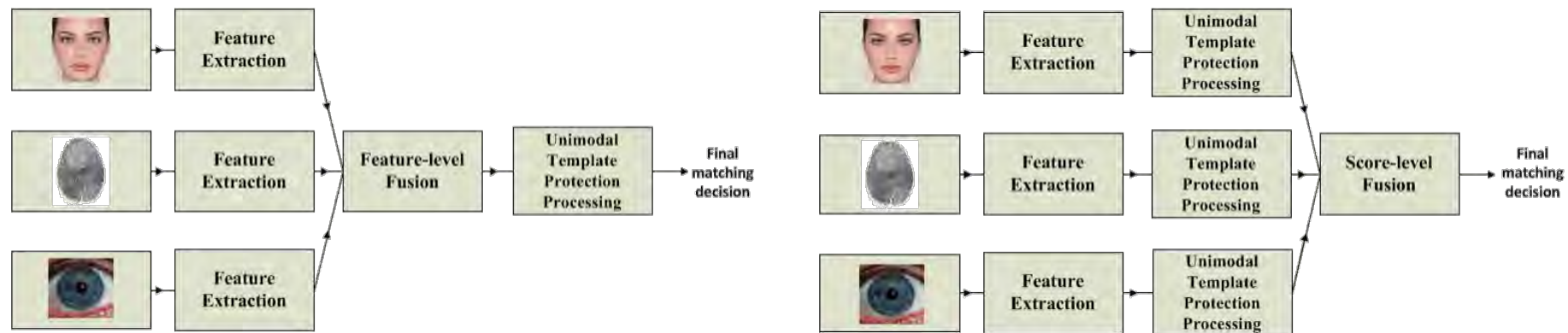
[kychou@comp.hkbu.edu.hk](mailto:kychou@comp.hkbu.edu.hk)

<https://www.comp.hkbu.edu.hk/~kychou>

- **Assistant Professor**
  - University of Surrey, UK,
- **Previous work experience**
  - Nanyang Technological University (Singapore)
- **Research interests:** Computer Vision, Machine Learning
- **Conference/Workshop services**
  - Associate Editor of International Journal of Computer Vision, 2023-present
  - Area Chair of CVPR 2024
  - Organizer of CVPR 2023 Tutorial on Prompting in Vision
  - Organizer of ICLR 2023 Workshop on Domain Generalization

# Multi-Modality Biometric template Protection (P C Yuen et al.)

- **Project goal:**
  - To seek for an effective multi-modal template protection technique for optimal preservation of user privacy, security and discrimination power.
- **Research Challenge:**
  - Overcome inherent tradeoff between security and discrimination power in the existing template protection techniques
  - Seek for the best template protection architectures among those involving multimodal fusion at different levels, which offer different degrees of security/privacy protection and performance accuracy
  - Put forward an effective feature transformation technique to convert multimodality features into a common form for effective feature level fusion

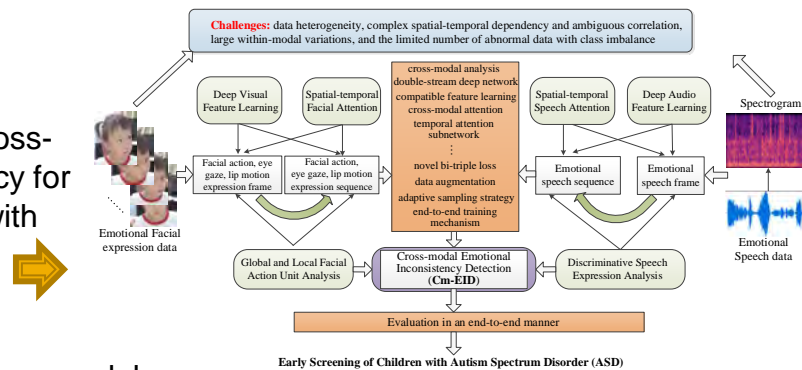




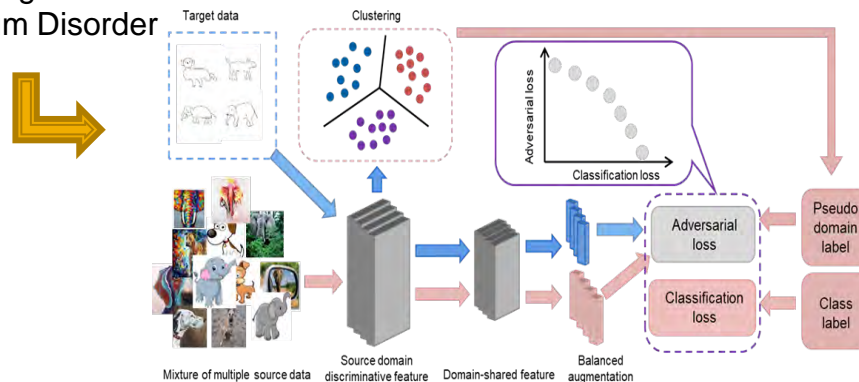
# Selected Research Projects (Yiu-ming Cheung)

Always looking for strong applicants for PhD students!

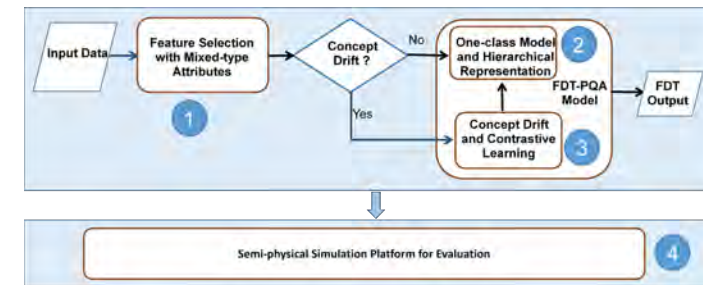
**Project 1:** On Detecting Cross-modal Emotional Inconsistency for Early Screening of Children with Autism Spectrum Disorder



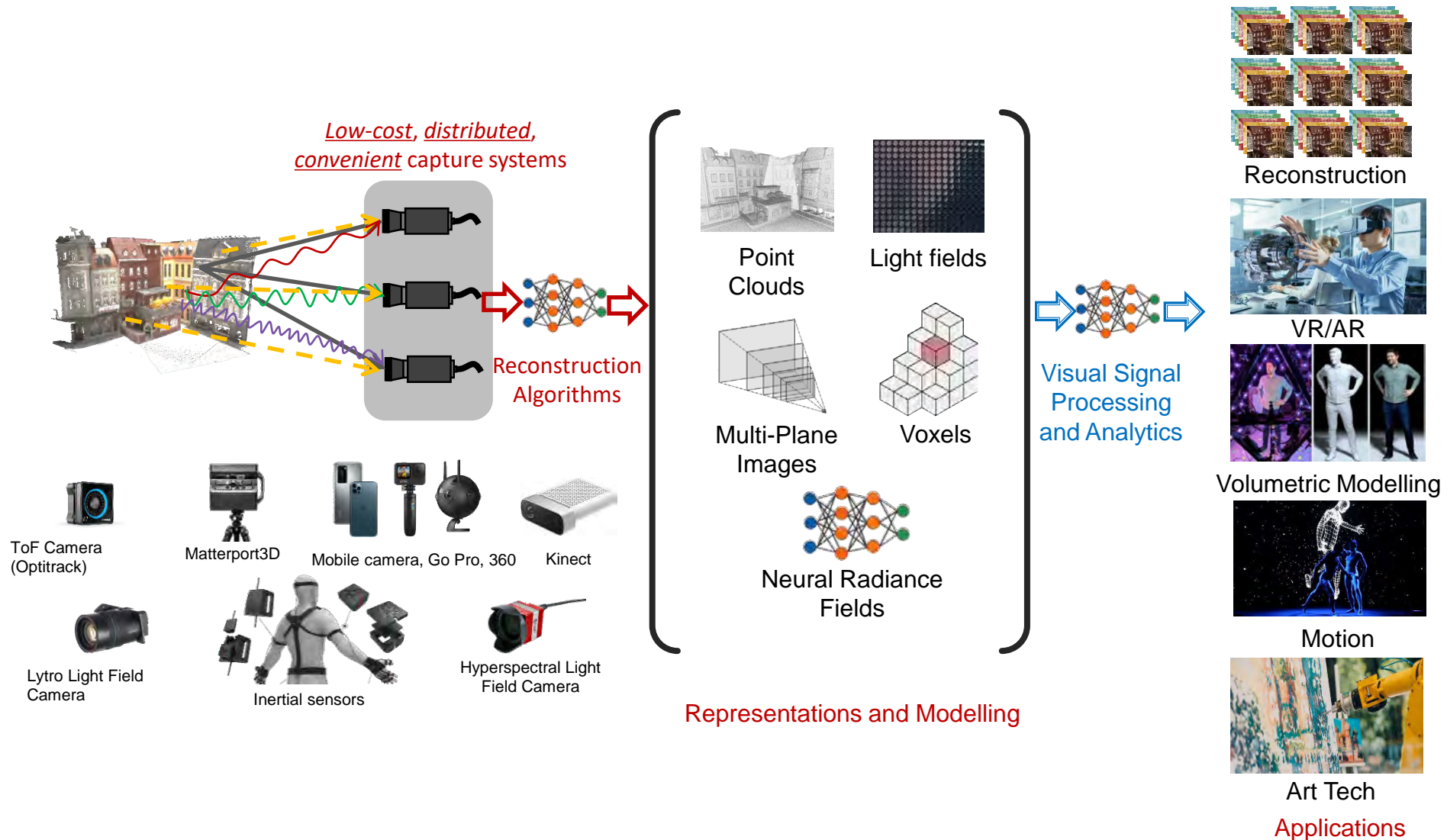
**Project 2:** On Detecting Cross-modal Emotional Inconsistency for Early Screening of Children with Autism Spectrum Disorder



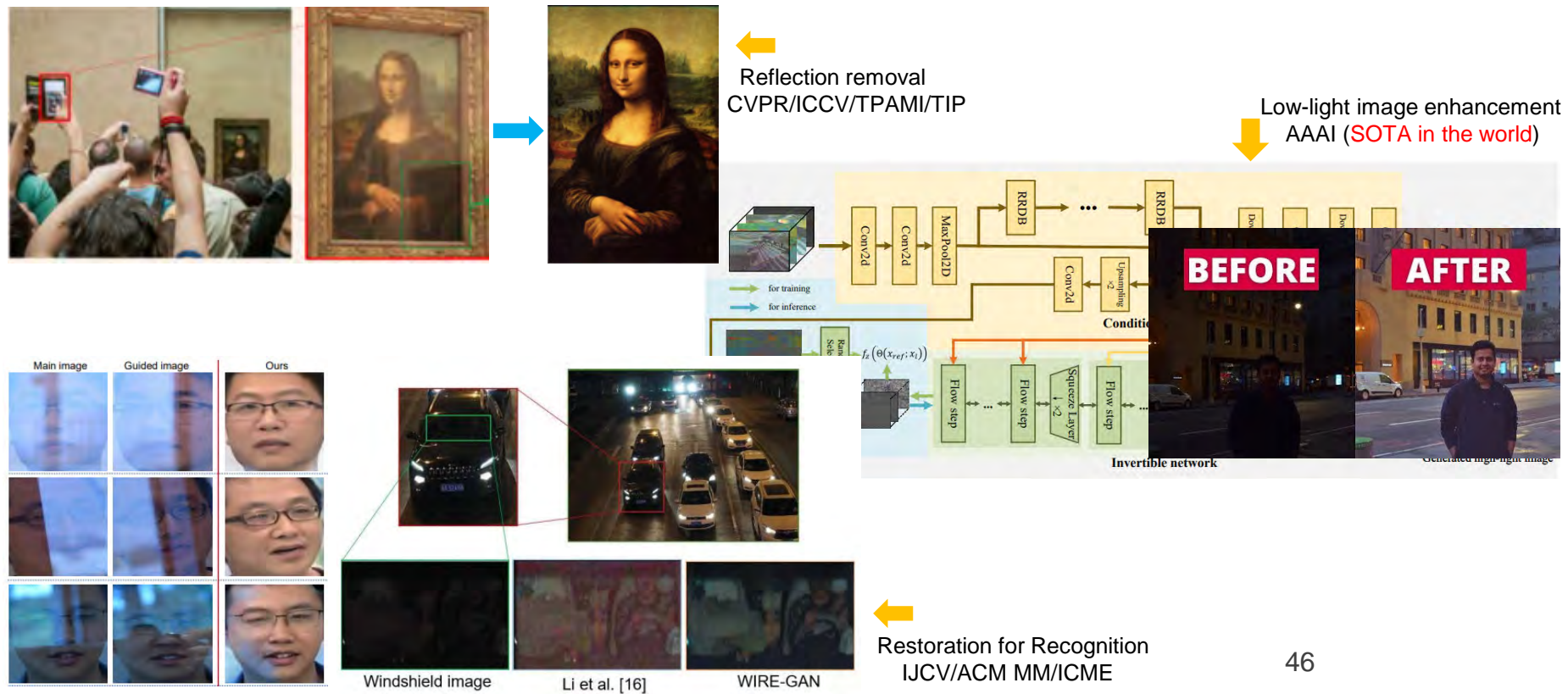
**Project 3:** Developing Machine Learning Methods for Industrial Big Data Analysis and Traceability of Product Quality Abnormality



# Multimedia Capture, Processing and Content Synthesis (Jie Chen et al.)




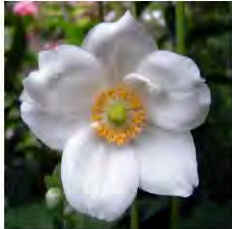


# Visual Restoration and its beyond (Renjie Wan *et. al.*)





# Learning to Prompt for Vision-Language Models

(Kaiyang Zhou et al.) Published in IJCV 2022

	Caltech101	Prompt	Accuracy
		a [CLASS].	82.68
		a photo of [CLASS].	80.81
		a photo of a [CLASS].	86.29
		[V] <sub>1</sub> [V] <sub>2</sub> ... [V] <sub>M</sub> [CLASS].	<b>91.83</b>
(a)			
	Flowers102	Prompt	Accuracy
		a photo of a [CLASS].	60.86
		a flower photo of a [CLASS].	65.81
		a photo of a [CLASS], a type of flower.	66.14
		[V] <sub>1</sub> [V] <sub>2</sub> ... [V] <sub>M</sub> [CLASS].	<b>94.51</b>
(b)			
	Describable Textures (DTD)	Prompt	Accuracy
		a photo of a [CLASS].	39.83
		a photo of a [CLASS] texture.	40.25
		[CLASS] texture.	42.32
		[V] <sub>1</sub> [V] <sub>2</sub> ... [V] <sub>M</sub> [CLASS].	<b>63.58</b>
(c)			
	EuroSAT	Prompt	Accuracy
		a photo of a [CLASS].	24.17
		a satellite photo of [CLASS].	37.46
		a centered satellite photo of [CLASS].	37.56
		[V] <sub>1</sub> [V] <sub>2</sub> ... [V] <sub>M</sub> [CLASS].	<b>83.53</b>
(d)			

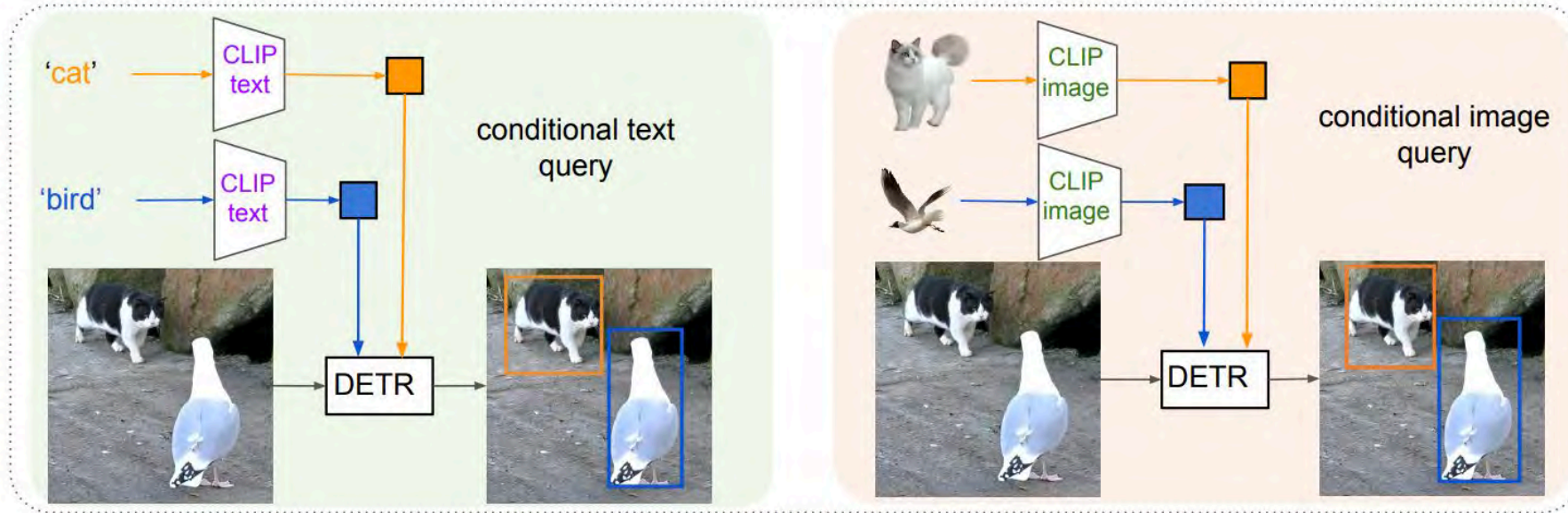
“How to design a good prompt for image recognition?”



***Our research presents a prompt learning method allowing large vision-language models to be adapted to downstream datasets using only few labelled examples!***

# Open-Vocabulary DETR with Conditional Matching

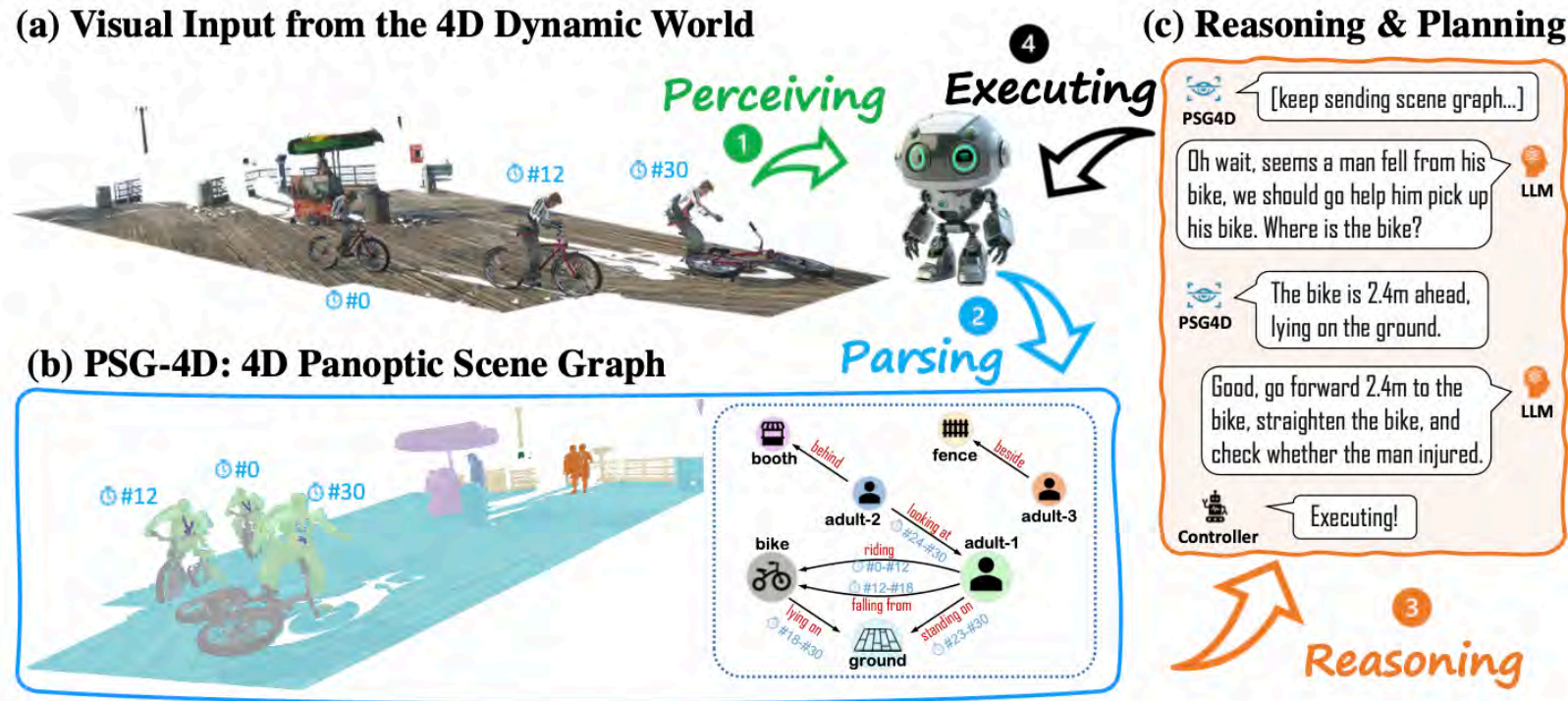
(Kaiyang Zhou et al.) Published in ECCV 2022



***Our prompting-based object detector allows user to specify objects of interest in the form of input text, such as “cat” and “bird”, or exemplar images!***

# 4D Panoptic Scene Graph Generation

(Kaiyang Zhou et al.) Published in NeurIPS 2023



*Our research enables robots to understand the 4D world using scene graph representations and to interact with human operators using natural language!*



# Distributed Systems and Networking (DSAN)

High-Performance GPU Computing

Internet of Things (IoT) and Sensor Networks

Cloud Computing; Data Center Networks

Wireless and Mobile Networks

# Faculty members (DSAN)



**Prof. Yiu-Wing Leung**

- BSc and PhD, Chinese University of Hong Kong, Hong Kong
- Research interests:
  - Networking,
  - Cloud computing,
  - Internet computing
- Publications:
  - Publications in major conferences and journals (e.g., IEEE INFOCOM, IEEE ICDCS, IEEE/ACM ToN, IEEE TMC, IEEE TC, IEEE TPDS, etc.)
- Recognitions:
  - Name is listed in "*Top 2% most-cited scientists in the world*" by Stanford University.

# Faculty members (DSAN)



**Dr. Henry Hong-Ning Dai**

<https://www.comp.hkbu.edu.hk/~henrydai/>

- **Associate Professor**
- **Education**
  - PhD, Chinese University of Hong Kong
- **Previous work experience**
  - Lingnan University, Hong Kong
  - Macau University of Science and Technology, Macao
  - Chinese University of Hong Kong, Hong Kong
- **Research Interests:**
  - Internet of Things, blockchain, and big data analytics
- **Associate Editor of International Journals:**
  - IEEE Communications Surveys & Tutorials
  - IEEE Transactions on Intelligent Transportation Systems
  - IEEE Transactions on Industrial Informatics
  - IEEE Transactions on Industrial Cyber-Physical Systems
  - Ad Hoc Networks (Elsevier)
- **Conference Services**
  - General Chair: BlockSys'21
  - PC Chair: IEEE Blockchain Symposium'21, Airbone and Maritime Mobile Systems and Services of VTC-Fall'21, BlockSys'20

# Faculty members (DSAN)



**Dr. Juncheng Wang**

<https://www.comp.hkbu.edu.hk/~jcwang/>

- **Education Background:**
  - PhD (**University of Toronto**, Canada, 2023)
  - MSc (University of Alberta, Canada, 2017)
  - BEng (Shanghai Jiao Tong University, **IEEE Class**, China, 2014)
- **Research interests:**
  - Networked Systems
  - Mobile Communications
  - Online Learning and Optimization
- **Publications:**
  - 24 journal and conference papers (14 as **first** author) including *INFOCOM*, *TON*, *TMC*, *TWC*, *CVPR*, *TSG*, *TIM*, etc.
  - 9 United States or International patent applications
- **Professional Services:**
  - Journal reviewer for *JSAC*, *TPDS*, *TCOM*, *TWC*, *TVT*, *TSG*, *TIM*, etc.
  - Conference PC member for *INFOCOM*, *ICDCS*

# Faculty members (DSAN)



**Dr. Amelie Chi Zhou**

[amelieczhou@hkbu.edu.hk](mailto:amelieczhou@hkbu.edu.hk)

[www.comp.hkbu.edu.hk/~amelieczhou](http://www.comp.hkbu.edu.hk/~amelieczhou)

- **Assistant Professor**

- PhD, Nanyang Technological University
- BEng/MSE, Beihang University

- **Research Interests**

- Parallel and Distributed Systems, Cloud Computing, High-Performance Computing

- **Research Recognition**

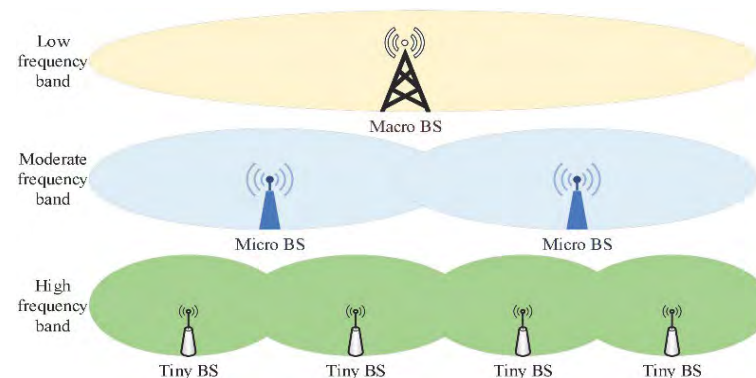
- IEEE TPDS Best Paper Award, 2021
- IEEE-CS TCHPC Early Career Researchers Award, 2021
- ACM SIGHPC China Rising Star Award, 2021

- **Technical Services**

- *Associate Editor*, IEEE TPDS
- *Editor*, Elsevier FGCS
- *Track Chair*: IPDPS'24 (Measurement), SC'22 (HPC&AI), etc.
- *PC Member*: FAST'22, HotStorage'22, HPDC'21, etc.

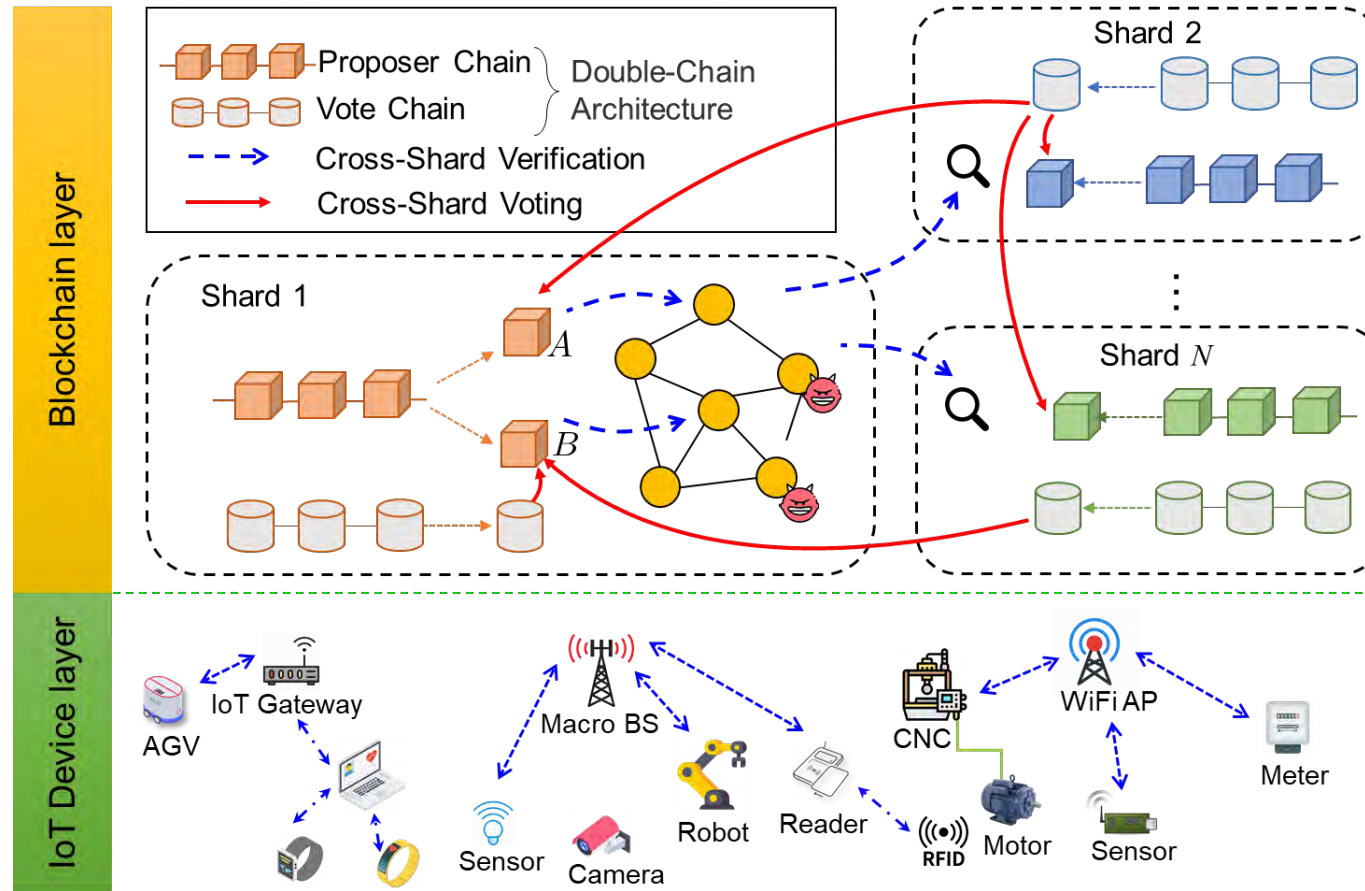
# Placement Optimization of Base Stations for 6G Networks (Yiu Wing Leung et al.)

- **6G networks:** The sixth generation (6G) networks are being researched to fulfill the mobile communication demands of the future digital society. To support ultra-high data rate, ultra-low latency and massive connections, 6G networks would adopt new communication technologies such as cell-free massive MIMO and non-orthogonal multiple access.
- **Placement optimization of base stations:** 6G networks would adopt different types of base stations at different frequency bands for different coverage. In the planning phase, it is necessary to determine the number and locations of each type of base stations while fulfilling some quality-of-service requirements and real-world constraints based on the new 6G communication technologies. This project is to formulate and solve the placement optimization problems.





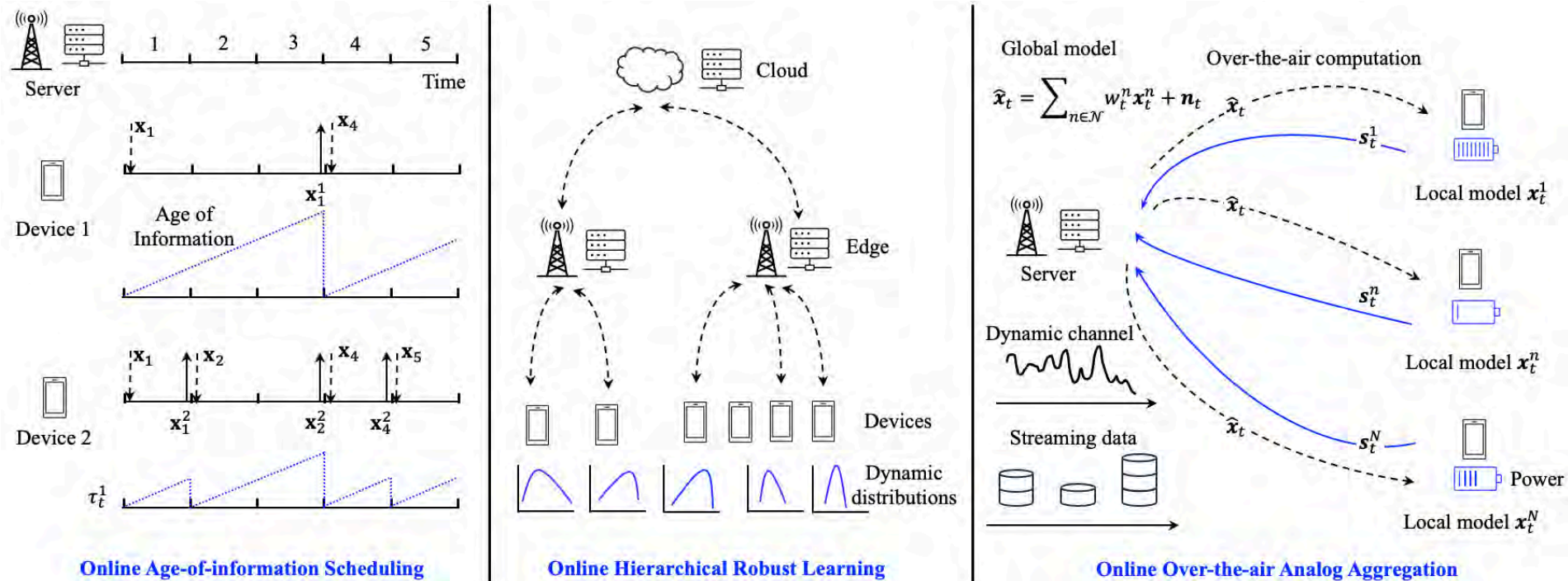
# Key technologies to improve performance of blockchain system for future IoT (Hong-Ning Dai)



The proposed project aims to improve the performance of blockchains by distributed artificial intelligence (AI)-enabled **sharding** and **off-chain routing** schemes in terms of high throughput, low latency, ensured security, and high reliability for supporting diverse IoT applications.

# Federated Online Learning and Optimization: Data Freshness, Model Robustness, and Communication Efficiency (Juncheng Wang et al.)

# ***Joint Online Optimization*** of Machine Learning and Wireless Communications



- [1] **J. Wang**, B. Liang, M. Dong, G. Boudreau, and H. Abou-Zeid, “Joint online optimization of model training and analog aggregation for wireless edge learning,” *IEEE/ACM Transactions on Networking (TON)*, Oct. 2023.
- [2] **J. Wang**, B. Liang, M. Dong, G. Boudreau, and A. Afana, “Online distributed optimization with efficient communication via temporal similarity,” in *Proceedings of IEEE International Conference on Computer Communications (INFOCOM)*, May 2023.
- [3] **J. Wang**, M. Dong, B. Liang, G. Boudreau, and H. Abou-Zeid, “Delay-tolerant OCO with long-term constraints: Algorithm and its application to network resource allocation,” *IEEE/ACM Transactions on Networking (TON)*, Feb. 2023.
- [4] **J. Wang**, B. Liang, M. Dong, G. Boudreau, and H. Abou-Zeid, “Semi-online precoding with information parsing for cooperative MIMO wireless networks,” in *Proceedings of IEEE International Conference on Computer Communications (INFOCOM)*, May 2022.

# High-Performance Systems for Graphs, AI and More

(Amelie Chi Zhou et al.)

## Modern Applications

(Graph processing, AI training/inference, Streaming, etc)

## Middleware (Our Work)

### HPC Applications

- MPI scheduling <sup>[1]</sup>
- Interference-aware I/O scheduling

### Graph Analytics

- Graph partitioning <sup>[2]</sup>
- Privacy-preserving graph engine

### AI Applications

- GPU-accelerated model training <sup>[3]</sup>
- PIM-assisted recomm.

## Parallel and Distributed Environments

(Geo-distributed systems, Many-core systems, GPU/PIM)

[1] AC. Zhou, et al., Efficient process mapping in geo-distributed cloud data centers. **SC 2017**

[2] AC. Zhou, et al., Adaptive Partitioning for Large-Scale Graph Analytics in Geo-Distributed Data Centers. **ICDE 2022**.

[3] Zhang, et al., An Efficient Parallel Secure Machine Learning Framework on GPUs. **IEEE TPDS 2021 (Best Paper Award)**

# PhD Program Structure

- 22 units of coursework
  - Typically, 3 units @ course
- A research project
- Opportunity to present research paper in International Conferences
- **Guaranteed overseas exchange**
  - Mandatory **1 to 6-months** research in an overseas university or research laboratory
- **Overseas post-doctoral scheme**
  - Support fresh graduates to gain more research experience at renowned overseas universities or research institute for half to one year

# Where Our Graduates Go?



## Industry



## Academia



## Further Research



# Ye Mang (PhD, 2019)



BSc, MSc  
(2009-2016)



PhD, HKPFS Awardee  
(2016-2019)



Exchange  
(2018.07-12)



*Full Professor  
Wuhan University*

## □ Achievement highlights

- Published **20+** first-authored **CCF-A** papers
- Awarded NSFC Excellent Young Scientists Fund 2021
- Google Scholar Citations: **7400+** and H-index: **37**
- Unsupervised Deep Learning without Human Annotation ([ICCV 17](#), [ECCV 18](#), [CVPR 19](#), [TIP 19](#), [CVPR 20](#))
  - *Cited by famous researchers, such Geoffrey Hinton (Godfathers of Deep Learning), Kaiming He (Facebook), Trevor Darrell (UCB),....*
- Robust Deep Learning in the Open-world ([AAAI 18](#), [IJCAI 18](#), [TIFS 20](#))
  - *Reported in media and attracted attention from many high-tech companies*



# Shi Shaohuai (PhD, 2020)



华南理工大学  
South China University of Technology

BSc  
(2006-2010)



MSc  
(2010-2013)



PhD  
(2016-2020)



Research Intern  
(2019-2020)



*Full Professor  
Harbin Institute of Technology,  
Shenzhen*

## □ Achievement highlights

- Published 40+ papers including CCF-A and CCF-B first-authored papers, and one US patent
- 海外优青
- Google Scholar Citations: 2300+ and H-index: 22
- Performance benchmarking for deep learning frameworks (250+ citations and Best Paper Award)
  - *Much attention from Google, Microsoft, and Amazon in discussing performance issues*
- Highly scalable deep learning training systems (IJCAI 19, ICDCS 19, INFOCOM 19 & 20)
  - *The world's fastest training on the ImageNet dataset using 2048 GPUs in July 2018 (Collaborated with Tencent)*

# Yin Kejing (PhD, 2021)



华南理工大学  
South China University of Technology

BSc  
(2011-2015)



PhD  
(2016-2021)



Exchange  
(2019-2020)



*Research Assistant Professor  
HKBU*

## □ Achievement highlights

- Published 12 papers including **CCF-A** and CCF-B first-authored papers
- Awarded Honorable Mention of 2021 Hong Kong Young Scientist
- Received Departmental RPg Performance Awards for three consecutive years
- Awarded one HRMF in Feb 2024
- Google Scholar Citations: **200+** and H-index: **8**
- Serve as reviewers for top conferences including NeurIPS, ICML, IJCAI, and AAAI

# Hong Kong is the window to China

## Our collaborating universities in China



# Enquiry

## Department of Computer Science, Hong Kong Baptist University

Executive Officer: Ms. Kristina Tsang

Hotline: (+852) 3411 2782 / 3411 7091

Email: [comp@comp.hkbu.edu.hk](mailto:comp@comp.hkbu.edu.hk)

Site: <https://www.comp.hkbu.edu.hk>

Thank you for your attention!

Q & A