Hongzhi CHEN

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ACADEMIC EXPERIENCE

2015.8 - Present **The Chinese University of Hong Kong (CUHK)** *Shatin*, Hong Kong
Ph.D. in Computer Science and Engineering
- Supervisor: Prof. James Cheng

2011.9 - 2015.6 **Huazhong University of Science and Technology (HUST)** *Wuhan*, China
B.Eng in Computer Science and Technology
Overall GPA: 3.88 / 4.00 Rank: 1/ 30/ 472 (**in a 30-student Talented Class**)

RESEARCH INTERESTS

My general research interests cover the broad area of distributed systems and databases, with special emphasis on distributed graph processing systems and distributed machine learning/deep learning systems. My current focus is on RDMA based OLTP/OLAP systems over knowledge graphs, deep learning system and Graph Neural Network.

WORK EXPERIENCE

2019.2 - Present **HUAWEI, 2012 Lab,** *Parallel and Distributed Institution* Shenzhen, China
- **Research Intern** in **MindSpore** Team, a general distributed Deep Learning Platform.

2017.5 - 2017.8 **University of Pennsylvania,** *NetDB Lab, Dept. CIS* PA, USA
- **Visiting Scholar**, Distributed Graph Query Optimization
  Supervisor: **Prof. Boon Thau Loo**.

2014.6 - 2015.6 **Microsoft Research Asia,** *Software Analytics Group* Beijing, China
- **Research Intern**, Large-scale Data Analytics, Distributed System.
  Supervisor: **Qingwei Lin** (Lead Researcher) and **Dr. Jianguang Lou** (Principle Researcher).

2013.9 - 2014.6 **HUST,** *IDC Lab, Dept. CSE* Wuhan, China
- **Research Intern**, System Optimization on Hadoop.
  Supervisor: **Prof. Ruixuan Li**

PUBLICATIONS

[1] *Large Scale Graph Mining with G-Miner* **SIGMOD'19**
Hongzhi Chen, Xiaoxi Wang, Chenghuan Huang, Juncheng Fang, Yifan Hou, Changji Li, James Cheng

[2] *Optimizing Declarative Graph Queries at Large Scale* **SIGMOD'19**
Qizhen Zhang, Akash Acharya, **Hongzhi Chen**, Simran Arora, Ang Chen, Vincent Liu, Boon Loo.

[3] *G-Miner: An Efficient Task-Oriented Graph Mining System.* **EuroSys'18**
Hongzhi Chen, Miao Liu, Yunjian Zhao, Xiao Yan, Da Yan, James Cheng.

[4] *Norm-Ranging LSH for Maximum Inner Product Search.* **NIPS'18**
Xiao Yan, Jinfeng Li, Xinyan Da, **Hongzhi Chen**, and James Cheng.

[5] *Scalable De Novo Genome Assembly Using Pregel.* **ICDE'18**
Da Yan, **Hongzhi Chen**, James Cheng, Zhenkun Cai, Bin Shao.

[6] *GraphD: Distributed Vertex-Centric Graph Processing Beyond the Memory Limit.* **TPDS'18**
Da Yan, Yuzhen Huang, Miao Liu, **Hongzhi Chen**, James Cheng, Huanhuan Wu, Chengcui Zhang.

[7] *Architectural Implications on the Performance and Cost of Graph Analytics Systems.* **SoCC'17**
Qizhen Zhang, **Hongzhi Chen**, Da Yan, James Cheng, Boon Thau Loo, Purushotham Bangalore.

[8] *G-thinker: Big Graph Mining Made Easier and Faster.* **arXiv'17**
Da Yan, **Hongzhi Chen**, James Cheng, M.Tamer.Ozsu, Qizhen Zhang, John C.S. Lui.

PROJECTS

My research focuses on the design and implementation of distributed systems as well as algorithms and applications. I have led or participated as the core developer of the following projects.

GraphRex An efficient framework for graph processing on datacenter infrastructure. The key technical contribution of GraphRex is the identification and optimization of a set of global operators whose efficient implementation is crucial to the good performance of large, datacenter-based graph analysis.

G-Miner A distributed graph processing system aimed at general graph mining problems, which have intensive local computation inside a subgraph. We modeled each subgraph processing as a task and designed a task-based pipeline to improve the parallelism between computation and communication. A dynamic task stealing mechanism as well as an efficient cache strategy were also proposed to further speed up the task processing.

G-thinker Real applications, such as graph matching and community detection, often require computation intensive graph analytics, which cannot be represented by vertex-centric algorithms for efficient execution in systems like Pregel and GraphLab. We proposed G-thinker, a new subgraph-centric general graph processing distributed system, which is natural for subgraph finding problem.

PPA-Assembly A scalable toolkit for de novo genome assembly was developed based on Pregel. PPA-Assembly provides a set of key operations in genome assembly, which were implemented by practical Pregel algorithms (PPAs) with strong performance guarantees.

FPM A novel and general distributed framework to mine frequent patterns, including frequent itemsets/sequences/graphs.

I also joined in some other research projects during my work at CUHK, UPenn and MSRA.

RANGE-LSH Using maximum inner product for similarity search, which significantly outperforms SIMPLE-LSH, and RANGE-LSH is robust to the shape of 2-norm distribution and different partitioning methods.

GraphD It offers out-of-core support for processing very big graphs in a small cluster of commodity PCs, with performance comparable with the state-of-the-art distributed in-memory graph systems.

LWCP A fault tolerance mechanism for Pregel-like systems with performance tens of times faster than the conventional checkpointing mechanisms.

More If you are also interested in my previous works at **MSRA**, **Software Analytics Group**, please visit my homepage for more details. My works at MSRA focused more on distributed data analytics, including OLAP, pattern mining, text clustering and anomaly detection. I mainly participated in 4 projects as a core developer, i.e. *Service-Intelligence*, *Service-Insider*, *iDice* and *In4*. In particular, both **Service-Intelligence** and **iDice** have been published in **ICSE' 2016**

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AWARDS & HONORS

2018.4 EuroSys Travel Award

2016.8 CUHK Postgraduate Studentship.

2015.6 **"Stars of Tomorrow" at Microsoft Research Asia** (Only 15% research interns won the Award)

2015.6 Outstanding Graduates (3% in HUST)

2014.10 CCF (China Computer Federation) National **Top 100** Outstanding Undergraduates (**Top 0.1%**)

2014.9 Academic Excellence Scholarship (2% in HUST)

2014.9 Merit Undergraduate (2% in HUST)

2013.9 National Undergraduate Scholarship (2% in HUST)

2013.9 Merit Undergraduate (2% in HUST)

2012.9 Most Outstanding Undergraduate (1% in HUST)

2012.9 Academic Excellence Scholarship (2% in HUST)

TEACHING

Spring, 2018 CSCI1020: Hands-on Introduction to C++

Fall, 2017 ENGG1110: Problem Solving By Programming
Spring, 2017 ENGG1110: Problem Solving By Programming
Fall, 2016 ENGG1110: Problem Solving By Programming

PROFESSIONAL ACTIVITIES

External Reviewer

2019 SIGMOD
2018 VLDB, ICDE
2017 VLDB, ICDE, CCGRID, BigData
2016 VLDB, KDD, SOCC, ICDM, DASFAA, BigData, APWeb

Participation in

2018 European Conference on Computer Systems, Porto, Portugal
2015 China National Computer Congress, Zhengzhou, China

SKILLS

Programming C, C++, C#, Java, Python
Operating Linux, Windows
Documentation Latex, MS Office, HTML