

Yicong Huang

Curriculum Vitae

Education

2019–June, **Ph.D., Computer Science**, *University of California, Irvine, CA, United States.*
2025 Lab: [Information Systems Group \(ISG\)](#) GPA: 3.95/4.0
Advisor: [Dr. Chen Li](#), Professor
Research Data-Processing Systems, Database Management Systems (DBMS), Data-Intensive Scalable
Interest: Computing (DISC), Machine Learning Systems.

2015–2019 **B.S., Computer Science**, *University of California, Irvine, CA, United States.*

Computer Science Publications (Selected)

- [1] **Yicong Huang**, Mangesh Bendre, Robert Christensen, Mahashweta Das, Chen Li, and Hao Yang.
“SWAT-RT: Low Latency Windowed Analytical Feature Enrichment on Real-time Streams with Out-of-order Support”. In: *In submission to MLSys* (2025).
- [2] Xiaozhen Liu, **Yicong Huang**, Xinyuan Lin, Avinash Kumar, Sadeem Alsudais, and Chen Li.
“Pasta: A Cost-Based Optimizer for Generating Pipelining Schedules for Dataflow DAGs”.
In: *Proceedings of the ACM SIGMOD International Conference on Management of Data (SIGMOD)*.
To appear. 2025.
- [3] Xi Lu*, **Yicong Huang***, Zuozhi Wang, and Chen Li.
“How Can AI Help Me with Data Science? An Exploration of AI-Assistants on Data Workflow Systems”.
In: *In submission to SIGCHI* (2025). *The first two authors share equal contributions.
- [4] Shengquan Ni, **Yicong Huang**, Zuozhi Wang, and Chen Li.
“IcedTea: Efficient and Responsive Time-Travel Debugging in Dataflow Systems”.
In: *In submission to VLDB* (2025).
- [5] **Yicong Huang**, Zuozhi Wang, and Chen Li.
“Demonstration of Udon: Line-by-line Debugging of User-Defined Functions in Data Workflows”.
In: *Companion of the 2024 International Conference on Management of Data, SIGMOD/PODS 2024, Santiago AA, Chile, June 9-15, 2024*.
Ed. by Pablo Barceló, Nayat Sánchez-Pi, Alexandra Meliou, and S. Sudarshan.
Best Demo Runner-Up Award. ACM, 2024, pp. 476–479. DOI: [10.1145/3626246.3654756](https://doi.org/10.1145/3626246.3654756).
URL: <https://doi.org/10.1145/3626246.3654756>.
- [6] Alexander K. Taylor*, **Yicong Huang***, Junheng Hao, Xinyuan Lin, Xiusi Chen, Wei Wang, and Chen Li.
“Data Science Tasks Implemented with Scripts versus GUI-Based Workflows: The Good, the Bad, and the Ugly”. In: *40th International Conference on Data Engineering, ICDE 2024 - Workshops, Utrecht, Netherlands, May 13-16, 2024*. *The first two authors share equal contributions. IEEE, 2024, pp. 267–277.
DOI: [10.1109/ICDEW61823.2024.00040](https://doi.org/10.1109/ICDEW61823.2024.00040).
URL: <https://doi.org/10.1109/ICDEW61823.2024.00040>.
- [7] Zuozhi Wang, **Yicong Huang**, Shengquan Ni, Avinash Kumar, Sadeem Alsudais, Xiaozhen Liu, Xinyuan Lin, Yunyan Ding, and Chen Li.
“Texera: A System for Collaborative and Interactive Data Analytics Using Workflows”.

In: *Proceedings of the VLDB Endowment (PVLDB)* 17.11 (2024), pp. 3580–3588.

DOI: [10.14778/3681954.3682022](https://doi.org/10.14778/3681954.3682022).

- [8] **Yicong Huang**, Zuozhi Wang, and Chen Li.
“Udon: Efficient Debugging of User-Defined Functions in Big Data Systems with Line-by-Line Control”.
In: *Proc. ACM Manag. Data* 1.4 (2023), 225:1–225:26. DOI: [10.1145/3626712](https://doi.org/10.1145/3626712).
URL: <https://doi.org/10.1145/3626712>.
- [9] Avinash Kumar, Sadeem Alsudais, Shengquan Ni, Zuozhi Wang, **Yicong Huang**, and Chen Li.
“Reshape: Adaptive Result-aware Skew Handling for Exploratory Analysis on Big Data”.
In: *CoRR abs/2208.13143* (2022). DOI: [10.48550/arXiv.2208.13143](https://doi.org/10.48550/arXiv.2208.13143). arXiv: [2208.13143](https://arxiv.org/abs/2208.13143).
URL: <https://doi.org/10.48550/arXiv.2208.13143>.
- [10] Xiaozhen Liu, Zuozhi Wang, Shengquan Ni, Sadeem Alsudais, **Yicong Huang**, Avinash Kumar, and Chen Li. “Demonstration of Collaborative and Interactive Workflow-Based Data Analytics in Texera”.
In: *Proc. VLDB Endow.* 15.12 (2022), pp. 3738–3741. DOI: [10.14778/3554821.3554888](https://doi.org/10.14778/3554821.3554888).
URL: <https://www.vldb.org/pvldb/vol15/p3738-liu.pdf>.
- [11] Zhihui Yang, **Yicong Huang**, Zuozhi Wang, Feng Gao, Yao Lu, Chen Li, and X. Sean Wang.
“Demonstration of Accelerating Machine Learning Inference Queries with Correlative Proxy Models”.
In: *Proc. VLDB Endow.* 15.12 (2022), pp. 3734–3737. DOI: [10.14778/3554821.3554887](https://doi.org/10.14778/3554821.3554887).
URL: <https://www.vldb.org/pvldb/vol15/p3734-yang.pdf>.
- [12] Zhihui Yang, Zuozhi Wang, **Yicong Huang**, Yao Lu, Chen Li, and X. Sean Wang.
“Optimizing Machine Learning Inference Queries with Correlative Proxy Models”.
In: *Proc. VLDB Endow.* 15.10 (2022), pp. 2032–2044. DOI: [10.14778/3547305.3547310](https://doi.org/10.14778/3547305.3547310).
URL: <https://www.vldb.org/pvldb/vol15/p2032-yang.pdf>.

Interdisciplinary Publications (Selected)

- [1] Judith Borghouts, **Yicong Huang**, Suellen Hopfer, Chen Li, and Gloria Mark. “Wording Matters: the Effect of Linguistic Characteristics and Political Ideology on Resharing of COVID-19 Vaccine Tweets”.
In: *Transactions on Computer-Human Interaction (TOCHI)* (2024).
- [2] Yunyan Ding, **Yicong Huang**, Pan Gao, Andy Thai, Atchuth Naveen Chilaparasetti, M Gopi, Xiangmin Xu, and Chen Li. “Brain image data processing using collaborative data workflows on Texera”.
In: *Frontiers in Neural Circuits* 18 (2024), p. 1398884.
- [3] Jessie WY Ko, Shengquan Ni, Alexander Taylor, Xiusi Chen, **Yicong Huang**, Avinash Kumar, Sadeem Alsudais, Zuozhi Wang, Xiaozhen Liu, Wei Wang, et al.
“How the experience of California wildfires shape Twitter climate change framings”.
In: *Climatic Change* 177.1 (2024), pp. 1–21.
- [4] Judith Borghouts, **Yicong Huang**, Sydney Gibbs, Suellen Hopfer, Chen Li, and Gloria Mark.
“Understanding underlying moral values and language use of COVID-19 vaccine attitudes on twitter”.
In: *PNAS nexus* 2.3 (2023), pgad013.
- [5] Joshua Rhee, **Yicong Huang**, Sadeem Alsudais, Shengquan Ni, Avinash Kumar, Chen Li, and David Timberlake. “The marketing and perceptions of non-tobacco blunt wraps on Twitter”.
In: *Substance Use and Misuse* (2023).
- [6] Yawen Guo, Jun Zhu, **Yicong Huang**, Lu He, Changyang He, Chen Li, and Kai Zheng.
“Public Opinions toward COVID-19 Vaccine Mandates: A Machine Learning-based Analysis of U.S. Tweets”.
In: *AMIA 2022, American Medical Informatics Association Annual Symposium, Washington, DC, USA, November 5-9, 2022*. AMIA, 2022. URL: <https://knowledge.amia.org/76677-amia-1.4637602/f006-1.4642154/f006-1.4642155/516-1.4642396/1066-1.4642393>.
- [7] Zimu Wang*, **Yicong Huang***, Wanjun Lu, Jiaxin Liu, Xinying Li, Suhua Zhu, Hongbing Liu, and Yong Song. “c-myc-mediated upregulation of NAT10 facilitates tumor development via cell cycle regulation in non-small cell lung cancer”.
In: *Medical Oncology* 39.10 (2022). *The first two authors share equal contributions, p. 140.


- [8] Lu He, Changyang He, Tera L. Reynolds, Qiushi Bai, **Yicong Huang**, Chen Li, Kai Zheng, and Yunan Chen. "Why do people oppose mask wearing? A comprehensive analysis of U.S. tweets during the COVID-19 pandemic". In: *J. Am. Medical Informatics Assoc.* 28.7 (2021), pp. 1564–1573. DOI: [10.1093/jamia/ocab047](https://doi.org/10.1093/jamia/ocab047). URL: <https://doi.org/10.1093/jamia/ocab047>.
- [9] Suellen Hopfer, Emilia J Fields, Yuwen Lu, Ganesh Ramakrishnan, Ted Grover, Quishi Bai, **Yicong Huang**, Chen Li, and Gloria Mark. "The social amplification and attenuation of COVID-19 risk perception shaping mask wearing behavior: a longitudinal twitter analysis". In: *PloS one* 16.9 (2021), e0257428.

Research Experience

2020 – Pres. **Texera** , *Interactive Workflow-based Big Data Analytics System*.

Scala, Typescript, Python, Arrow

- Leading the team effort on designing the system from all layers, including the distributed engine, compiler, scheduler, etc.
- Leading the effort on interactive debugging of Python UDF during the runtime of a workflow.
- Designed and implemented the Python processing engine on top of Akka Actor system, targeting PySpark & PyFlink.
- Integrated ML and AI to optimize the workflow runtime.
- Contributed in exploration of fault tolerance, version control, resource management and other aspects of the system.
- Maintaining a live service at [Texera Prod](#)

2019 – 2020 **Cloudberry** , *A Middleware System for Large Scale Data Visualization*.

Scala, Javascript, AWS

- Conducted tweet visualization with an interactive map, aggregating and displaying 4TB data stream.
- Integrated COVID-data with social media data on the interactive map.
- Built a fully scalable elastic service that can be load balanced on 20+ AWS machines, [CoronavirusTwittermap](#).

2019 – 2020 **ML-OPT**, *Machine Learning Pipeline Optimization*.

Python

- Explored using Machine Learning models to optimize Machine Learning Pipeline with a confidence guarantee.
- Conducted optimization on video recognition models (e.g., YOLOv3) by 25% with 98% accuracy guarantee, and NLP models (e.g., StanfordNLP) by 45% with 98% accuracy guarantee.
- Full research paper and demo accepted by VLDB 2022.

2019 **Wildfire**, *Wildfire Detection & Visualization with Social Media*.

Python, Typescript, PostgreSQL

- Led team of 10 masters and undergraduates in detecting wildfires based on tweets and satellite data.
- Built data collection pipelines for real-time tweets, satellite data from NOAA, fire reports from USGS, etc.
- Integrated Machine Learning models such as AllenNLP, StanfordNLP, CNN, RNN, ANN for semantic analysis on text; ResNet50, VGG for images classifications.

2018 **Blockchain**, *Blockchain in Fin-tech & Blockchain and Smart Contracts*.

Python, C++

- Reviewed over 200 white papers on smart contracts implemented on blockchains such as Ethereum and Bitcoin.
- Developed a prototype smart contract on the Ethereum blockchain.
- Organized the California-Shanghai Innovation Dialogue Conference in 2018.

Grants Writing Experience (Contributed)

- 2024 **dkNET Coordinating Unit: Harnessing the Power of AI and Data Science for Collaborative Discovery and Sharing in the DK Community.**
National Institutes of Health (NIH), National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
- Contact PI: Jeffrey S. Grethe
 - Other PIs: Shuibing Chen, Chen Li, Wei Wang
 - Period: 2024 – 2029
 - Funding: total \$10M for 5 years
- My Role: Contributed to Aim 3: Computational Core: Develop and deploy unified ML models and workflows.
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- 2022 **Collaborative Research: Collaborative Machine-Learning-Centric Data Analytics at Scale.**
National Science Foundation (NSF)
- Contact PI: Chen Li
 - Other PIs: Suellen Hopfer
 - Period: 2021 – 2024
 - Funding: \$913,992
- My Role: Contributed to Aim 2: Supporting Debugging of External UDF's during Execution.
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- 2020 **RAPID: Leveraging Twitter Data for Real-time Public Health Responses to Coronavirus: Identifying Affective Desensitization, Loneliness and Depression, and Trust in Message Sources and Content.**
National Science Foundation (NSF)
- Contact PI: Gloria Mark
 - Other PIs: Chen Li, Suellen Hopfer
 - Period: 2020
 - Funding: \$180,000
- My Role: Collected data and wrote about preliminary results.

Industry Experience

- Summer 2024 **Software Engineer Intern, Observe Inc.,** San Mateo, CA, United States.
Dataset Transformers, Go, Snowflake
- Contributed to the development of a dataset transformer for log store analytics, especially focusing on window maintenance of live data streams.
 - Investigated the use of Snowflake Time Travel to optimize data partitioning and clustering for transformed datasets.
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- Summer 2022 **Research Intern, Visa Research, Visa Inc.,** Palo Alto, CA, United States.
SWAT-RT: Real-time Window Aggregation on Streaming Systems, C++, Redis, RedisTimeSeries, Kafka, Flink
- Developed real-time window aggregation framework with out-of-order event support.
 - Designed space-efficient, versatile list for in-memory raw-event storage.
 - Proposed out-of-order handling algorithms, outperforming existing Flink designs.
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- Summer 2020 **Research Intern, HTAP Database System, C++, Kudu, MySQL.**
Infrastructure System Lab, ByteDance Inc., Mountain View, CA, United States

- Worked on an HTAP database to support instant query on the real-time data.
- Implemented TP (MySQL) metadata to AP (Kudu) schema conversion.
- Integrated lock-free data structure for heap implementation.

Teaching Experience

2024 **Associate Instructor (Lecturer).**

University of California, Irvine, CA, United States

S'24 *ICS 80: Data Science and AI/ML Using Workflows* [Syllabus](#)

- Designed and taught a new course that helped non-CS students to gain knowledge of data science, AI, and ML in a short period.
- 42 undergraduate students enrolled.

2019 — Pres. **Research Mentor.**

University of California, Irvine, CA, United States

PhD students: ◦ **2023-2024:** Raj Mohanty (PhD), Jiadong Bai (PhD), Shagoto Rahman Shrestho (PhD);
◦ **2022-2023:** Xinyuan Lin (PhD), Yunyan Ding (PhD);

Master students: ◦ **2022-2023:** Aditya Verma (MS), Sreetej Reddy (MS), Dhruv Raipure (MS), Jiaxi Chen (MS);
◦ **2019-2020:** Yang Cao (MS);

Undergraduate students: ◦ **2023-2024:** Kevin Wu;
◦ **2022-2023:** Chengxi Li (MS), Ethan Wong (MS), Tianyun Yuan (MS), Tony Liu (MS);
◦ **2021-2022:** Zhen Guan – UCSD (MS), Jiashu Zhang – Hong Kong Polytechnic University (PhD), Yinan Zhou – UCI (PhD), Andrew Li (MS), Eric Peng (MS), Jiyang Wu (MS), Zeyu Li (MS);
◦ **2020-2021:** Chen He – CMU (MS), Bihao Xu – UChicago (MS), Conghuai Tan (MS), Make Tao (MS), Mingshuo Liu (MS), Qifan Yu (MS);
◦ **2019-2020:** Dayue Bai – UIUC (MS), Yinan Zhou – UCI (MS), Shiqi Wu – Berkeley (MS), Christine Xinrong Huang – CMU (MS), Tianran Liu – Univ of Washington (MS), Yutong Wang – UCD (PhD), Tingxuan Gu – CMU (MS), Yichi Zhang – NYU (MS), Xinyue Han – UCLA (MS), Qiaonan Huang (Hugo) – Brown (MS), Yuan Fu – CMU (SE-SV), Yuqi Huai – UCI (PhD), Quanzhen Du – UCSD (MS), Shiling (Scarlett) Zhang – Cornell (MS), Zeyad Kelani (MS);

2018 — 2022 **Teaching Assistant.**

University of California, Irvine, CA, United States

W'22 *CS 222/122C: Principles of Data Management*

F'21 *CS 122B: Projects in Databases and Web Applications*

S'21 *CS 122B: Projects in Databases and Web Applications*

W'21 *ICS 51: Introduction to Computer Organization*

F'20 *CS 222/122C: Principles of Data Management*

S'20 *CS 122B: Projects in Databases and Web Applications*

W'20 *CS 222/122C: Principles of Data Management*

F'19 *CS 222/122C: Principles of Data Management*

S'19 *CS 122B: Projects in Databases and Web Applications*

W'19 *CS 122B: Projects in Databases and Web Applications*

F'18 *CS 141: Concepts of Programming Languages I*

2018 **Mentor.**

Dreams for Schools APPJAM+, Yorba Linda High School, Yorba Linda, CA, United States

2016 — 2018 **Tutor.**

University of California, Irvine, CA, United States

W'18 *ICS 46: Data Structure Implementation and Analysis*

F'17 *ICS 45J: Programming in Java as a Second Language*

S'17 *ICS 33: Intermediate Programming*

W'17 *ICS 32: Programming with Software Libraries*

F'16 *ICS 31, Introduction to Programming*

Fellowships & Awards

2024 Honored **Best Demo Award Runner-Up Award** at SIGMOD 2024.

2024 Recipient of **Graduate Dean's Dissertation Fellowship** from University of California, Irvine, in recognition of a highly impactful thesis.

2024 Awarded of **Student Travel Award** to attend a international conference **SIGMOD 2024** in Guangzhou, China.

2023 Recipient of **Public Impact Fellowship** from Univerisy of California, Irvine, for conducting impactful research for the public.

2023 Awarded of **Student Travel Award** to attend a international conference **VLDB 2023** in Vancouver, Canada.

2020 Awarded of **Best Lecturer Award** for excellence in teaching at CUCS.

Media & Press (Selected)

Talks

2024 **Interactive Debugging Meets Spark: Techniques, Opportunities, and Challenges.**
An invited talk at Databricks Inc., Mountain View, CA, United States.

2024 **Texera: A System for Collaborative and Interactive Data Analytics Using Workflows.**
A paper presentation talk at VLDB 2024, Guangzhou, China

2024 **The Journey to Build Texera.**
An invited talk at ISG Reunion, Irvine, CA, United States.

2024 **Udon: Efficient Debugging of User-Defined Functions in Big Data Systems.**
A paper presentation talk at SIGMOD 2024, Santiago, Chile.

2022 **Data Challenges in Streaming Systems.**
A talk at VISA Research, AI Research team, Palo Alto, CA, United States.

Blogs

2024 **Adding R UDF to Texera: The Journey.**
Texera Blog, Kevin Wu and [Yicong Huang](#)

2023 **Enhancing the UDF Editor by Adding Language Server Support.**
Texera Blog, Aditya Verma, Dhruv Raipure, Jiaxi Chen, Sreetej Reddy, and [Yicong Huang](#)

2023 **Using Texera to Perform Single-cell RNA Sequencing Analysis with R Language.**
Texera Blog, [Yicong Huang](#)

Services

Reviewer

2024 **External Reviewer.**

IEEE Transactions on Knowledge and Data Engineering (TKDE)

2024 **Program Committee.**

ACM SIGMOD International Conference on Management of Data (SIGMOD) - Artifact Review and Reproducibility (ARI)

Student Volunteer

2023 **ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD).**

Long Beach, CA, United States

2023 **IEEE International Conference on Data Engineering (ICDE).**

Anaheim, CA, United States

2019 **International Conference on Very Large Data Bases (VLDB).**

Los Angeles, CA, United States

2018 **California-Shanghai Innovation Dialogue Conference (CSID).**

Irvine, CA, United States

Computer skills

Proficient	Python, Java/Scala, C/C++, JavaScript/TypeScript, Golang, Lisp, Prolog, MySQL, PostgreSQL
Intermediate	HTML, CSS, SQL, R, Redis
Programming Concepts	MapReduce, OOD, Functional, Logical Programming, Model-View-Control, Multithreading
Frameworks	Arrow, Hadoop, Spark, Flink, Kudu, Protobuf, Spring, Angular 2+, Django, Flask, Express, ReactJS, Elasticsearch
Services	AWS, GCP, GitHub, Docker