

# Juexiao Zhou

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## RESEARCH INTERESTS

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I am interested in several research areas, including machine learning, deep learning, privacy, security, bioinformatics, and intelligent healthcare. My primary research focuses on secure bioinformatics and privacy-preserving intelligent healthcare. I am also interested in exploring the application of AI in medical imaging and bioinformatics.

## ACADEMIC EXPERIENCES

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### King Abdullah University of Science and Technology

Saudi Arabia

*PhD Student in Computer Science, Supervised by Prof. Xin Gao; **GPA: 4.00/4.00***

*Dec 2021 – Present*

*Master of Science, M.S. in Computer Science, Supervised by Prof. Xin Gao; **GPA: 3.95/4.00***

*Aug 2020 – Dec 2021*

### Southern University of Science and Technology

Shenzhen, China

*Bachelor of Science, B.S. (Honored) in Bioinformatics; **GPA: 3.92/4.00***

*Sep 2016 – Jun 2020*

## PUBLICATIONS

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### Journal

(# equal contribution, \* corresponding author)

[1] A comprehensive benchmarking with practical guidelines for cellular deconvolution of spatial transcriptomic. Haoyang Li<sup>#</sup>, **Juexiao Zhou**<sup>#</sup>, Zhongxiao Li, Siyuan Chen, Xingyu Liao, Bin Zhang, Ruochi Zhang, Yu Wang, Shiwei Sun, Xin Gao\*. **Nature Communications (IF: 14.919)**. DOI: 10.1038/s41467-023-37168-7

[2] Accurate transcriptome-wide identification and quantification of alternative polyadenylation from RNA-seq data with APAI. Yongkang Long<sup>#</sup>, Bin Zhang<sup>#</sup>, Shuye Tian, Jiajia Chan, **Juexiao Zhou**, Zhongxiao Li, Yisheng Li, Zheng An, Xingyu Liao, Yu Wang, Shiwei Sun, Ying Xu, Yvonne Tay, Wei Chen\*, Xin Gao\*. **Genome Research (IF: 9.438)**. In press.

[3] AB-Gen: Antibody Library Design with Generative Pre-trained Transformer and Deep Reinforcement Learning. Xiaopeng Xu, Tiantian Xu, **Juexiao Zhou**, Xingyu Liao, Ruochi Zhang, Yu Wang, Lu Zhang, Xin Gao\*. **Genomics, Proteomics & Bioinformatics (IF: 6.615)**. In press.

[4] Predicting the antigenic evolution of SARS-COV-2 with deep learning. Wenkai Han<sup>#</sup>, NingNing Chen<sup>#</sup>, Xinzhou Xu, Adil Salhi, **Juexiao Zhou**, Zhongxiao Li, Huawen Zhong, Elva Gao, Ruochi Zhang, Yu Wang, Shiwei Sun, Peter Cheung, Xin Gao\*. **Nature Communications (IF: 14.919)**. In press.

[5] Applications of Deep Learning in Understanding Gene Regulation. Zhongxiao Li<sup>#</sup>, Elva Gao<sup>#</sup>, **Juexiao Zhou**, Wenkai Han, Xiaopeng Xu, and Xin Gao\*. **Cell Reports Methods**. DOI: 10.1016/j.crmeth.2022.100384

[6] Annotating TSSs in Multiple Cell Types Based on DNA Sequences and RNA-seq Data via DeeReCT-TSS. **Juexiao Zhou**<sup>#</sup>, Bin Zhang<sup>#</sup>, Haoyang Li, Longxi Zhou, Zhongxiao Li, Yongkang Long, Wenkai Han, Mengran Wang, Huanhuan Cui, Wei Chen, Xin Gao\*. **Genomics, Proteomics & Bioinformatics (IF: 6.615)**. DOI: 10.1016/j.gpb.2022.11.010

[7] SD2: Spatially resolved transcriptomics deconvolution through integration of spatial and dropout information. Haoyang Li, Hanmin Li, **Juexiao Zhou** and Xin Gao\*. **Bioinformatics (IF: 6.931)**. DOI: 10.1093/bioinformatics/btac605

[8] An Interpretable Deep Learning Workflow for Discovering Sub-Visual Abnormalities in CT Scans of COVID-19 Inpatients and Survivors. Longxi Zhou<sup>#</sup>, Xianglin Meng<sup>#</sup>, Yuxin Huang<sup>#</sup>, Kai Kang<sup>#</sup>, **Juexiao Zhou**, Yuetan Chu, Haoyang Li, Dexuan Xie, Jiannan Zhang, Weizhen Yang, Na Bai, Yi Zhao, Mingyan Zhao, Guohua Wang, Lawrence Carin, Xigang Xiao, Kaijiang Yu, Zhaowen Qiu, Xin Gao\*. **Nature machine intelligence (IF: 25.9)**. DOI: 10.1038/s42256-022-00483-7

[9] An interpretable computer-aided diagnosis method for periodontitis from panoramic radiographs. Haoyang Li, **Juexiao Zhou**, Yi Zhou, Jieyu Chen, Feng Gao, Ying Xu, Xin Gao\*. **Frontiers in Physiology, section Computational Physiology and Medicine (IF: 4.755)**. DOI: 10.3389/fphys.2021.655556.

- [10] DeeReCT-APA: Prediction of Alternative Polyadenylation Site Usage through Deep Learning. Zhongxiao Li, Yisheng Li, Bin Zhang, Yu Li, Yongkang Long, **Juexiao Zhou**, Xudong Zou, Min Zhang, Yuhui Hu, Wei Chen, Xin Gao\*. **Genomics Proteomics and Bioinformatics (IF: 6.615)**. DOI: 10.1016/j.gpb.2020.05.004.
- [11] CaMeRe: A novel tool for inference of cancer metabolic reprogramming. Haoyang Li, **Juexiao Zhou**, Huiyan Sun, Zhaowen Qiu, Xin Gao\* and Ying Xu\*. **Front. Oncol., 2020 (IF: 6.244)**. DOI: 10.3389/fonc.2020.00207.
- [12] Pan-tissue analysis of allelic alternative polyadenylation suggests widespread functional regulation. Yisheng Li<sup>#</sup>, Bernhard Schaefer<sup>#</sup>, Xudong Zou, Min Zhang, Florian Heyd, Wei Sun, Bin Zhang, Guipeng Li, Weizheng Liang, Yuhao He, **Juexiao Zhou**, Yunfei Li, Liang Fang, Yuhui Hu\*. **Molecular Systems Biology, 2020 (IF: 12.744)**. DOI: 10.15252/msb.20199367.
- [13] A Rapid, Accurate and Machine-agnostic Segmentation and Quantification Method for CT-based COVID-19 Diagnosis. Liongxi Zhou, Zhongxiao Li, **Juexiao Zhou**, Haoyang Li, Yupeng Chen, Yuxin Huang, Dexuan Xie, Lintao Zhao, Ming Fan, Shahrukh Hashmi, Faisal AbdelKareem, Riham Eiada, Xigang Xiao, Lihua Li, Zhaowen Qiu, and Xin Gao\*. **Transactions on Medical Imaging, 2020 (IF: 11.037)**. DOI: 10.1109/TMI.2020.3001810.

## Conference

(<sup>#</sup> equal contribution, \* corresponding author)

- [14] Automatic and interpretable model for periodontitis diagnosis in panoramic radiographs. Haoyang Li, **Juexiao Zhou**, Yi Zhou, Jieyu Chen, Feng Gao, Ying Xu, Xin Gao\*. Medical Image Computing and Computer Assisted Interventions 2020. DOI: 10.1007/978-3-030-59713-9\_44.

## Posters & Technical Reports

(<sup>#</sup> equal contribution, \* corresponding author)

- [15] Privacy in Bioinformatics and Intelligent Healthcare. **Juexiao Zhou**, Xin Gao\*. Poster. Smart-Health Student Research Symposium, KAUST, Saudi Arabia, November 10, 2022.
- [16] Deetal-Perio: DEEP denTAL Advisor for Periodontitis Diagnosis based on Two-step Segmentation of Teeth and Gingiva with Lower-dimensional Features. Haoyang Li, **Juexiao Zhou**, Xin Gao\*. Poster. DigitalHealth, KAUST, 2020.
- [17] CaMeRe: A novel tool for inference of cancer metabolic reprogramming. Haoyang Li, **Juexiao Zhou**, Huiyan Sun, Zhaowen Qiu, Xin Gao\* and Ying Xu\*. Poster. Advance In Artificial Intelligence, KAUST, 2019.
- [18] DeeRect-PAS—A Deep-Learning based method for Transcriptome-wide PAS Identification. Yongkang Long, **Juexiao Zhou**, Zhongxiao Li, Wei Chen, Xin Gao\*. Poster. Advance In Artificial Intelligence, KAUST, 2019.
- [19] Systematical discovery of cis-elements regulating alternative polyadenylation in mammalian cells. Min Zhang, Yisheng Li, **Juexiao Zhou**, Yuhao He, Guipeng Li, Liang Fang, Wei Chen\*. Poster. RNA Biology, CSH Asia, 2019.
- [20] Systematical discovery of cis-elements regulating alternative polyadenylation in mammalian cells. Min Zhang, Yisheng Li, **Juexiao Zhou**, Yuhao He, Guipeng Li, Liang Fang, Wei Chen\*. Poster. Regulatory RNAs, Cell Symposia, Berlin, Germany, May 12-14, 2019.

## Pre-Prints

(<sup>#</sup> equal contribution, \* corresponding author)

- [21] Repetitive DNA sequence detection and its role in the human genome. Xingyu Liao, Wufei Zhu, **Juexiao Zhou**, Haoyang Li, Xiaopeng Xu, Bin Zhang, Xin Gao\*. under review.
- [22] Audit to Forget: A Unified Method to Revoke Patients' Private Data in Intelligent Healthcare. **Juexiao Zhou**<sup>#</sup>, Haoyang Li<sup>#</sup>, Xingyu Liao, Bin Zhang, Wenjia He, Zhongxiao Li, Longxi Zhou, Xin Gao\*. under review.
- [23] GPT generates more diverse scaffolds than GRU in exploring the chemical space. Xiaopeng Xu, **Juexiao Zhou**, Chen Zhu, Qing Zhan, Zhongxiao Li, Ruochi Zhang, Xingyu Liao, Xin Gao\*. under review.
- [24] An end-to-end workflow for robust pulmonary artery-vein segmentation on thick-slice chest CT. Yuetan Chu<sup>#</sup>, Longxi Zhou<sup>#</sup>, **Juexiao Zhou**, Yuxin Huang, Tianyi Xing, Dexuan Xie, Xigang Xiao, Zhaowen Qiu, Xin Gao\*. under review.
- [25] Personalized and privacy-preserving federated heterogeneous medical image analysis with PPPML-HMI. **Juexiao Zhou**<sup>#</sup>, Longxi Zhou<sup>#</sup>, Di Wang, Xiaopeng Xu, Haoyang Li, Yuetan Chu, Wenkai Han, Xin Gao\*. under review.

[26] PPML-Omics: a Privacy-Preserving federated Machine Learning system protects patients' privacy from omic data. **Juexiao Zhou**<sup>#</sup>, Siyuan Chen<sup>#</sup>, Yulian Wu<sup>#</sup>, Haoyang Li, Bin Zhang, Longxi Zhou, Yan Hu, Zihang Xiang, Zhongxiao Li, Ningning Chen, Wenkai Han, Di Wang and Xin Gao\*. under review.

[27] A Workflow for Automatic, Accurate and Robust Breast Tumor Segmentation on Multi-Database DCE-MRI. Longxi Zhou, Yitong Ding, Jiayang Guo, Ming Fan, **Juexiao Zhou**, Haoyang Li, Yujiao Li, Yuxin Huang, Yi Zhao, Yuetan Chu, Kun Wang, Qiming Fang, Xin Gao, Hongxia Zhang, Lihua Li. under review.

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## WORK EXPERIENCE

### **King Abdullah University of Science and Technology**

*Student Ambassador, CEMSE*

Saudi Arabia

*Dec 2021 – Present*

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## TEACHING

### **CS220, Data Analytics**

*Teaching Assistant*

KAUST

*Fall 2022/2023*

- Cooperated with Prof. Xin Gao

### **BioE 201/230 Foundations of Bioengineering**

*Teaching Labs*

Building 9 Room 4225, KAUST

*Fall 2022/2023*

- Cooperated with Prof. Xin Gao
- Lab 1. Genome data analysis, 2022.08.30, Content: Python basics, D/RNA sequence analysis, Biopython, BLAST, Reference genome
- Lab 2. Protein sequence analysis, 2022.09.06, Content: Protein sequence analysis, MSA, PDB, PyMOL, Secondary structure prediction
- Lab 3. Protein structure and function, 2022.09.13, Content: Ab initio with PyRosetta, AlphaFold2, NucleicNet, Docking with Smina, Pfam annotation with deep learning

### **CS398 Graduate Seminar**

*Teaching Assistant*

KAUST

*Spring 2022*

- Cooperated with Prof. Dominik Michels

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## HONORS & AWARDS

### **King Abdullah University of Science and Technology, KAUST, 2021-Present, PhD, Computer Science**

- KAUST AII's NeurIPS travel grant, 2022
- CEMSE Dean's List Award, 2022
- Excellent Research Award, CEMSE, 2021

### **King Abdullah University of Science and Technology, KAUST, 2020-2021, Master of Science, Computer Science**

- Student ambassador, CEMSE, 2021
- Yearly best student award, CEMSE, 2021
- Full scholarship for MS/PhD study, 2020

### **Southern University of Science and Technology, SUSTech, 2016-2020, Bachelor of Science, Bioinformatics, Biology**

- Outstanding graduate of SUSTech, 2020.
- Cum Laude Graduate of the Department of Biology (Top 1/10), 2020.
- The Guinness world record for "the most vows received by a single civilized act activity", 2019
- Candidate for 2019 National Scholarship, 2019
- Summer social practice excellent experience Award, 2018
- Excellent Student, The First Prize Scholarship, 2018
- Outstanding volunteer for the 12th CBIS Biennial Meeting, Shenzhen, China, 2018

- Candidate for 2018 National Scholarship, 2018
- Outstanding Volunteer of the 3rd Shenzhen International Life Science & Health Industry Summit (2016) Excellent Student, The First Prize Scholarship, 2017
- Dean scholarship, The First Prize Scholarship, 2017
- Excellent Student Cadre, 2017
- Outstanding Volunteer of 2017 Shenzhen International Precision Medicine Summit, 2017
- Alma mater practice excellent team, 2017
- National Literary Creation Award, 2016
- Excellent Student, The Second Prize Scholarship, 2016

## MEMBERSHIPS

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- Chinese Association for Artificial Intelligence (CAAI) Member
- The international Asia-Pacific Bioinformatics Network (APBioNET) Member

## TALKS

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- Audit to Forget: A Unified Method to Revoke Patients' Private Data in Intelligent Healthcare. *Poster*. CBRC session, KAUST Research Open Week, Saudi Arabia, March 2, 2023
- Audit to Forget: A Unified Method to Revoke Patients' Private Data in Intelligent Healthcare. *Oral & Poster*. Spotlight, Rising Stars in AI Symposium 2023 at KAUST, Saudi Arabia, Feb 2, 2023
- Privacy in Bioinformatics and Intelligent Healthcare. *Poster*. Smart-Health Student Research Symposium, KAUST, Saudi Arabia, November 10, 2022.
- PPML-Omics: a Privacy-Preserving federated Machine Learning system protects patients' privacy from omic data. *Oral*. CBRC Dual Seminar, King Abdullah University of Science and Technology, Saudi Arabia, March 29, 2022
- PPML-Omics: a Privacy-Preserving federated Machine Learning system protects patients' privacy from omic data. *Oral*. BDAI, Beijing, China March 9, 2022

## ACADEMIC SERVICES

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### Reviewer

(*Journal/Conference Name, number of reviews*)

- Genome Biology, 1
- Genome Research, 2
- Heliyon, 1
- IJCAI-ECAI 2022, 1
- ICONIP2020, 1
- ICMLA2021, 1
- Journal of Bioinformatics and Computational Biology, 1
- MICCAI2020, 1
- Multimedia Systems, 1
- SIGKDD2022, 2

### Conference Administrator

- The 21st International Conference on Bioinformatics (InCoB2022), Administrator