Jiacheng Xie

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EDUCATION

Ph.D ***Computer Science**, University of Missouri, Columbia*

(2020- present) ***Advisor:** Pro.f Dong Xu*

***Training:** Medical Imaging, Computer Vision*

M.S. ***Software Engineering**, Jilin University (JLU), China*

(2016-2019) ***Advisor:** Pro.f Yanchun Liang*

***Training:** Machine Learning, Computer Graphics*

B.E. ***Software Engineering**, Jilin University(JLU), China*

(2012-2016)

RESEARCH INTERESTS

- *Medical imaging analysis, clinical decision support.*
- *Epidemiological analysis using social media data.*
- *Applications of Artificial Intelligence in medicine and healthcare.*

ACADEMIC EXPERIENCE

Research Assistant (*2020 - Present*) *University of Missouri, Columbia, MO*

- Conducted research on the application of deep learning and *natural language processing (NLP)* in clinical diagnosis and medical report generation.
- Designed and trained multimodal models integrating medical images (e.g., tongue images, radiology scans) and clinical text using *PyTorch* and *Transformers.*
- Collected and preprocessed large-scale clinical datasets, including electronic health records (EHRs) and annotated medical images.
- Evaluated model performance using metrics such as *F1-score*, *BLEU score*, and clinical relevance benchmarks.
- Collaborated with physicians and interdisciplinary researchers to ensure clinical validity and translational value of research findings.

Volunteer Researcher (*2024 - Present*) *U.S. Geological Survey (USGS), Columbia, MO*

- Developed a web-based data platform for real-time oil spill monitoring using multispectral fluorescence imaging of water samples.
- Built a backend system to store, manage, and visualize fluorescence images and metadata using *PostgreSQL* and *FastAPI*.
- Applied deep learning models (CNNs) to classify oil-contaminated water samples from multispectral fluorescence images.
- Integrated Python-based image preprocessing pipelines, including normalization, denoising, and feature extraction.
- Collaborated with geologists and environmental engineers to align model outputs with field assessments and scientific accuracy.

Undergraduate Thesis Supervisor (*2024 - Present*) *Beijing Institute of Technology, Zhuhai*

- Supervised seven undergraduate students in their senior thesis projects on topics related to medical image analysis, machine learning, and mobile health applications.
- Guided students through problem formulation, dataset preparation, model development (e.g., *CNN*, *SVM*), and experimental evaluation.
- Provided weekly one-on-one mentoring sessions, offering feedback on algorithm design, code implementation, and technical writing.
- Reviewed and edited research reports, helped students prepare for oral defenses, and ensured timely project delivery.
- One project received departmental recognition and was presented at the university-level graduation exhibition.

Visiting scholar (*Sep 2018 – May 2019*) *Shanghai University of Traditional Chinese Medicine*

- Conducted research on intelligent tongue diagnosis systems integrating clinical data and image-based analysis.
- Developed a deep learning-based segmentation pipeline using *U-Net* and *Mask R-CNN* to extract tongue regions from raw images.
- Utilized *Pytorch* and *OpenCV* for image preprocessing, augmentation, and morphological filtering.
- Collaborated with TCM-affiliated hospitals to collect and annotate over 1,000 tongue images from clinical patients.
- Built a structured dataset for downstream TCM classification tasks, including body constitution and syndrome differentiation.

Visiting scholar (*Nov 2017 – Jan 2018*) *Massachusetts Institute of Technology, USA*

- Collaborated with MIT Media Lab on the Happimeter project, a smartwatch-based system for recognizing and visualizing human emotions in real time.
- Developed data processing pipelines to analyze sensor streams (e.g., heart rate, motion) from wearable devices using Python and cloud-based services.
- Built and maintained web-based dashboards to visualize users' emotional states and energy levels, using *React*, *D3.js*, and *Flask*.
- Worked with cross-disciplinary teams to ensure alignment between user experience design, affective computing models, and real-world usability.
- Contributed to model evaluation, personalization algorithms, and ongoing deployment of mobile- and cloud-integrated emotion tracking systems

Visiting scholar *(Sep 2017 – Sep 2018*) *University of Missouri, Columbia, MO*

- Fully funded by the *China Scholarship Council (CSC)* to conduct joint research in artificial intelligence and Traditional Chinese Medicine (TCM).
- Developed deep learning models (e.g., *ResNet*, *CNNs*) for automated classification of TCM body constitution types based on tongue images and patient attributes.
- Collected and curated multi-modal clinical datasets from partner hospitals, including image and structured diagnostic data.
- Conducted model evaluation using *accuracy*, *F1-score*, and *confusion matrix* on real-world clinical datasets.
- Collaborated with interdisciplinary teams from computer science and traditional medicine to ensure clinical interpretability and usability of the AI system.

INDUSTRIAL EXPERIENCE

Product Manager – Hotel Business Unit *Shanghai, China*
*Ctrip (*https://www.ctrip.com/*)* *2015 – 2016*

- Led product planning and iteration for hotel booking web platform, improving search and conversion experience for millions of users.
- Defined product requirements for personalized recommendation features using user behavior and booking history.
- Coordinated with data science and backend teams to optimize pricing algorithms and inventory availability logic.
- Conducted user research, *A/B testing*, and competitive analysis to guide roadmap prioritization and feature rollout.
- Managed cross-functional communication between business stakeholders, design, and technical teams to ensure on-time delivery.

Front-End Engineer *Beijing, China*
*Renren Inc (*https://www.renren.com/*)* *2014 – 2015*

- Developed and maintained key front-end modules of the Renren social networking site using *jQuery*, *Backbone.js*, and *HTML5/CSS3*.
- Implemented interactive UI components such as dynamic feed updates, profile editing, and photo galleries with *AJAX* and *JSON*.
- Modularized *JavaScript* codebase using *RequireJS*, improving maintainability and load performance across multiple pages.
- Collaborated with designers to optimize cross-browser compatibility and enhance user experience on *Chrome*, *Firefox*, and *IE*.
- Participated in front-end performance tuning, reducing page render time by optimizing DOM manipulation and asset loading.
- Worked closely with backend developers to integrate *RESTful* APIs and ensure smooth data exchange in user-facing features.

TEACHING EXPERIENCE

Adjunct Instructor (*2022 - Present*) *Beijing Institute of Technology, Zhuhai*

- Taught core undergraduate courses including *Algorithm Design*, *Data Structures*, and *Machine Learning*, with instruction delivered in English to a bilingual class of Chinese and German students.
- Designed and delivered curriculum emphasizing algorithmic thinking, computational complexity, and practical coding in *C/C++* and *Python*.
- Guided students through the implementation of classical algorithms such as *Dijkstra's*, *Dynamic Programming*, *Divide and Conquer*, and *Decision Trees*.
- Supervised student teams in course projects and mentored research initiatives, with several students advancing to international exchange or graduate study.

Teaching Assistant (*2021-2022*) *University of Missouri, Columbia*

- Assisted in teaching *CMP_SC 8050*: Algorithm Design, a graduate-level course covering advanced topics such as graph algorithms, dynamic programming, and computational complexity.
- Held weekly office hours and discussion sessions to guide students in implementing bioinformatics algorithms using *C* and command-line tools.
- Graded assignments, projects, and exams for approximately 30 graduate students, offering timely and constructive feedback.
- Collaborated with the instructor to design assignments, update course materials, and enhance overall course delivery.
- Provided individualized academic support to help students understand and implement complex algorithms such as dynamic programming and tree-based methods in *C*.

Guest Lecturer (*2021 –2022*) *Zhuhai College of Jilin University*

- Delivered a short-term intensive course on deep learning to undergraduate students majoring in computer science and artificial intelligence.
- Covered key topics including neural network architectures, backpropagation, *CNNs*, *RNNs*, and applications in computer vision and natural language processing.
- Provided hands-on instruction using *PyTorch* and *TensorFlow*, guiding students through model implementation and evaluation.
- Designed programming assignments and final project to assess students' ability to build and optimize deep learning models.
- Promoted academic exchange by introducing frontier research trends and career pathways in AI.

SKILLS

- **Full-Stack Programming:** *Python (PyTorch, NumPy, Pandas, Scikit-learn), OpenCV, C/C++, JavaScript, MySQL, Git, iOS(Swift), Android(Java), HTML/CSS.*
- **Data Science:** *Supervised learning (regression, classification), Unsupervised learning (clustering, factorization), Statistical modeling, Data wrangling, Visualization.*
- **Scientific Writing:** *research papers, grant proposals, review papers.*
- **High-Performance Computing:** *GPU programming (CUDA basics), cluster usage , cloud (AWS/GCP).*

POSTER & PRESENTATION

• Poster presentation at the "*Medical Imaging Conference (MIC)*" in Tampa, Florida, USA. The poster title is "*TOM: A Universal Tongue Optimization Model for Medical Tongue Image Segmentation*" Nov 2024

• Poster presentation at the *American Medical Informatics Association (AMIA) 2023 Annual Symposium* in New Orleans, LA, USA. The poster title is "*Covlab: An Online Tool for Monitoring and Understanding COVID-19 Trends and Patterns Based on Self-reporting Tweets*" Nov 2023

• Poster presentation at the *2023 IEEE International Conference on Medical Artificial Intelligence (MedAI) in* Shanghai, China. The poster title is "*An Online Tool for Understanding and Monitoring COVID-19 Trends and Spread Based on Self-Reporting Tweets*" Oct 2023

• Oral presentation at *Institute of Computational Biology, Northeast Normal University in* Changchun, China. The title is "*Applications of Computer Vision in Biomedical Fields*" Jul 2022

• Oral presentation at *Beijing Institute of Technology,* Zhuhai, China. The title is "*Applications and Challenges of Computer Vision in Medical Imaging*" Nov 2021

• Oral presentation at the *School of Basic Medical Sciences, Shanghai University of Traditional Chinese Medicine in* Shanghai, China. The title is "*AI Applications for Traditional Chinese Medicine*" Sep 2019

SELECTED PAPERS

1. ***Xie J**, Zhang Z, Zeng S, et al. Leveraging Large Language Models for Infectious Disease Surveillance—Using a Web Service for Monitoring COVID-19 Patterns From Self-Reporting Tweets: Content Analysis[J]. Journal of Medical Internet Research, 2025, 27(1): e63190.*
2. ***Xie, J.**, Yu, Y., Zhang, Z., Zeng, S., He, J., Vasireddy, A., ... & Xu, D. (2025). TCM-Ladder: A Benchmark for Multimodal Question Answering on Traditional Chinese Medicine. arXiv preprint arXiv:2505.24063.*
3. **Xie, J.**, et al. "TOM: A Universal Tongue Optimization Model for Medical Tongue Image Segmentation." *2024 IEEE Nuclear Science Symposium (NSS), Medical Imaging Conference (MIC) and Room Temperature Semiconductor Detector Conference (RTSD)*. IEEE, 2024.
4. **Xie, J.**, Zhang, Z., Hilliard, J., An, G., Tang, X., Yu, Y., ... & Xu, D. (2023, November). An Online Tool for Understanding and Monitoring COVID-19 Trends and Spread Based on Self-Reporting Tweets. In *2023 IEEE International Conference on Medical Artificial Intelligence (MedAI)* (pp. 55-60). IEEE.
5. **Xie J**, Jing C, Zhang Z, et al. Digital tongue image analyses for health assessment[J]. Medical Review, 2021, 1(2): 172-198.
6. Poudel, B., **Xie, J**., Guo, C., Watt, O., Pulster, E., Patel, R. J., ... & Xu, D. Real-Time Oil Spill Concentration Assessment Through Fluorescence Imaging and Deep Learning. Available at SSRN 5237044.
7. Liu, D. P., et al. "Assessing Environmental Oil Spill Based on Fluorescence Images of Water Samples and Deep Learning." *Journal of Environmental Informatics* 42.1 (2023).

SELECTED AWARDS

1. China Scholarship Council (CSC) Scholarship, *China*
2. National *Second-Class* Scholarship, *Jilin University*
3. *First Prize*, National College Students Information Literacy Contest, *China*
4. *Second Prize*, National Innovation and Entrepreneurship Training Program, *China*
5. *First Prize,* ACM Programming Ccontet*, Jilin University*
6. *Graduate Outstanding Scholarship, Jilin University*