CHEN JIN

Research Fellow, UCL, UK   *web: https://chenjin.netlify.app/*

RESEARCH INTERESTS

Deep learning, computer vision, data-efficient sampling, self/ semi-supervised learning, representation/ transfer/ multimodal learning (*applications: segmentation, VAE/GAN, classification, super-resolution, 3D-reconstruction*)

PROFESSIONAL EXPERIENCE

- **University College London**   London, UK
Research Fellow (machine learning, CMIC at UCL's AI Centre)   *Mar.2019 –*

- **Heriot-Watt University**   Edinburgh, UK
Research Associate (3D modelling of porous media)   *Nov.2017 –Nov.2018*

- **Canadian Natural Resources International (UK)**   Aberdeen, UK
Research Intern (numerical reservoir simulation)   *Aug.2013 –Dec.2014*

EDUCATION

- **Heriot-Watt University**   Edinburgh, UK
Ph.D. Petroleum Engineering - Image Processing and Modelling   *March. 2013–Nov. 2017*
Thesis: Multi-Scale/Modality Reconstruction of Porous Media

- **Heriot-Watt University**   Edinburgh, UK
MSc Petroleum Engineering (GPA 2:1)   *Aug. 2011 –Aug. 2012*
Subject ranked 9th (world) and 2nd (UK) by QS 2020

- **China University of Petroleum**   Qingdao, China
B.E. Energy and Fuels (GPA 86/100)   *September. 2007 –July. 2011*
Subject ranked 14th (world) by USnews 2022

AWARDS AND SCHOLARSHIPS

- Outstanding International Student **Scholarship** - Xinjiang (top 20 in the UK)   2016
- James-Watt **Scholarship**, Heriot-Watt University   2014 - 2016
- SINOPEC Research **Scholarship**   2014 - 2016
- Science & Technology Innovation **Award** and **Scholarship**, China University of Petroleum   2008 and 2009
- Chinese High School **Physics Olympiad**, **Silver Award**, 28th Provincial (top <0.02%, 1st/ 2000 in the City)   2006

SELECTED PUBLICATIONS

- **Jin, C.**, Tanno, R., Mertzanidou, T., Panagiotaki, E., and Alexander, D.C.,. Learning to Downsample for Segmentation of Ultra-High Resolution Images. **ICLR 2022.**

- Xu, M., Zhou, Y., **Jin, C.**, Blumberg, S., Wilson, F., Oxtoby, N., Alexander, D., and Jacob, J., Learning Morphological Feature Perturbations for Semi-Supervised Segmentation. **MIDL 2022.**

- Xu, M., Zhou, Y., Hu, Y., **Jin, C.**, Oxtoby, N., Alexander, D., and Jacob, J., Semi-Supervised Segmentation of Medical Images with Pseudo Labels. **MICCAI 2022 (Under Review).**

- **Jin, C.**, Tanno, R., Xu, M., Mertzanidou, T. and Alexander, D.C.,. Foveation for Segmentation of Ultra-High Resolution Images. **arXiv 2020**.

- Zhang, L., Tanno, R., Xu, M., **Jin, C.**, Jacob, J., Cicarrelli, O., Barkhof, F. and Alexander, D., Disentangling Human Error from Ground Truth in Segmentation of Medical Images. **NeurIPS 2020**.

- **Jin, C.**, Tanno, R., Xu, M., Mertzanidou, T. and Alexander, D.C., October. Foveation for Segmentation of Mega-Pixel Histology Images. **MICCAI 2020**.

- Zhang, L., Tanno, R., Bronik, K., **Jin, C.**, Nachev, P., Barkhof, F., Ciccarelli, O. and Alexander, D.C., October. Learning to Segment When Experts Disagree. **MICCAI 2020**.

- Olga, F., **Jin, C.**, Mertzanidou, T., Alexander, D.C. and Bakal, C. Deep Neighbour-Based Multiple Instance Learning for Histopathology Image Classification. **Journal (Under Review).**

RESEARCH PROJECTS

Efficient sampling for segmentation of ultra-high resolution images
- Developed an **attention-based deformable down-sampling** method for end-to-end optimisation of low-cost segmentation accuracy at a limited budget, improved accuracy of up to 10% and saved computation of up to 90% over SoTA, and published at **ICLR 2022** as the **leading author**.
- Developed an **attention-based end-to-end trainable** "**patch loader**" to hard/soft sample the best size-resolution trade-off configuration at each location for optimal segmentation accuracy, achieved SoTA, published at **MICCAI/arxiv extension** as the **leading author**.
- Co-authored **semi-supervised** methods published at **MIDL 2022** and **MICCAI 2022 (submitted)**.

Reconstruction, image super-resolution and label fusion
- Contributed to **problem formulation** and **STAPLE label fusion** baseline of the **MICCAI/NeurIPS 2020 publication** on disentangling inter-reader annotation variability in segmentation;
- Applied **3D reconstruction** for tumour cells images and co-authored a paper **submitted** to **Nature Genetics**.
- Developed a deep **recurrent multiscale pyramid network** for image **super-resolution** task.

Multiscale image analysis and reconstruction (PhD Thesis, 2017)
- Developed a **multi-scale/moda image processing**, **fusion** and **reconstruction** protocol for porous rock analysis.
- Developed a **weak supervised** iterative convolutional net (based on filter banks, AdaBoost and auto-context) that improves **segmented** connectivity of thin linear fracture, **presented (2016)/ poster (2018) at conferences**.
- **3D** porous media **reconstruction** via multiple-point statistics method (conditional to neighbouring "patch").
- Developed a mineral texture **classification** method based on **machine learning** (patch-wise **random forest**).

MENTORSHIP

- **Four UCL MSc projects (three distinctions):** D. Deak (2021) - CNN super-resolution, C. Alexandru (2021) GAN super-resolution. E. Edwards (2021) - CNN detection, K. Grigoriadis (2020) - CNN segmentation.
- **PhD co-supervision, Olga Fourkioti** (ICR, 2019-Present), who performs research on deep multiple instances learning for histological image classification.

TALKS AND ACADEMIC SERVICES

- **Foveation for Segmentation of Mega-Pixel Histology Image: IPMI 2021** guest Lecture, **MedICSS 2021 Summer School** (**top 3 best projects out of 14**), **MICCAI 2020, CMIC open day**.
- **Reviewer:** TIP, MICCAI

SKILLS

- Python, Matlab, C/C++, R, JavaScript, Batch.
- Pytorch, Tensorflow, Keras, Jupyter, Linux, Cloud/Cluster, ImageJ (FIJI), ParaView, Cinema4D.