

**PERSONAL PROFILE**

Jin has **multidisciplinary** research experience in **deep learning** and **computer vision** across **computer science**, **medical-image** and **geo-image** sectors. His recent research focuses on developing either **data-efficient** or **computation-efficient** machine learning methods, and applied on a set of **budgeted large-scale computer vision tasks**, e.g. **segmentation**, **classification**, **super-resolution** and **3D-reconstruction**. He is also interested in designing **self-supervised** algorithms that allow disentangled **representation learning** from **multiple modalities**, **scales** and **tasks** at minimal supervision. He has an ultimate goal of building **Artificial General Intelligence**.

**PROFESSIONAL HISTORY****Research Fellow, University College London, London, UK****Mar.2019 –Present**

- Develop deep learning methods and published **7 top AI Conference and Journal articles** (includes under-review).
- Hosted **MedICSS 2021 Summer School** project and taught one-week **deep learning course for segmentation (theory and coding)**, and lead a team of **7 researchers** achieved **top 3 projects among the 14 teams**.
- Supervise/co-supervised **1 PhD** and **4 MSc students** on **deep learning projects (3 distinctions)**.
- Oral talk at top conference (**MICCAI**), **IPMI 2021** guest Lecture and various seminars (e.g. **CMIC open day**).
- Chaired research group meetings (of size 20+ researchers) for a period of over 1.5 yrs.

**Research Associate, Heriot-Watt University, Edinburgh, UK****Nov.2017 –Nov.2018**

- Built **3D images statistical modelling** protocol for simulation mineral, deployed in Python, Matlab, and Tcl.

**Intern Student, Canadian Natural Resources International (UK) Limited****Aug.2013 –Dec.2014**

- Performed **numerical simulation** analysis and **presented** to development team helped on decisions worth millions.

**RESEARCH PROJECTS****Ultra-high resolution image analysis**

- Developed a **learnable downsampler** for **efficient segmentation** at a limited budget, improved accuracy of up to **10%** and **saved computation** of up to **90% over SoTA**, and **accepted by ICLR 2022** as the **leading author**.
- Developed a joint “**learnable data loader**” optimise the patch size-resolution trade-off at each location for segmenting large images, achieved **SoTA**, **published at MICCAI/extensive preprint** as the **leading author**.
- Co-authored an **attention-based semi-supervised** method and **submitted to MIDL** as the **third author**.

**Disentangling inter-reader annotation variability in segmentation**

- Co-authored **MICCAI/NeurIPS 2020 publication** contributed on problem formulation and STAPLE baseline;

**Medical histology image analysis**

- **Co-supervised one PhD student** performing research on **deep multiple instance learning** for large histological image **classification** and **submitted** as the **second author**.
- **Co-supervised two MSc projects** performing **segmentation (distinction)** and **detection** on histology images.
- Applied **3D reconstruction** method for tumour cells and image analysis in immunofluorescence images.

**Image super-resolution**

- Developed a deep **recurrent multiscale pyramid network** for image **super-resolution** task.
- **Proposed and independently supervised two MSc projects (both distinctions)** on **super-resolution** with CNN and GAN based methods.

**Weak supervised deep neural model for segmentation**

- Developed a **weak supervised** iterative convolutional net (based on ad-hoc filter banks, AdaBoost and auto-context) that auto-improves segmented connectivity of thin linear pattern, **presented (2016)/ poster (2018) at conferences**.

**Multiscale image analysis and reconstruction workflow (PhD Thesis, 2017)**

- Developed a multi-scale/moda image analysis, fusion and reconstruction protocol for digital rock analysis.
- 3D pore-grain image reconstruction via multiple-point statistics method (conditional to neighbouring “patch”).
- Developed an automated patch-based rock pattern classification procedure based on random forest.

# CHEN JIN

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## PROGRAMMING:

Python, Matlab, C/C++, R, JavaScript, Batch.

## TOOLS:

Pytorch, Tensorflow, Keras, Jupyter, Linux, Cloud/Cluster, ImageJ (FIJI), ParaView, Cinema4D.

## EDUCATION

**Ph.D. Computational Geoscience**, Heriot-Watt University, Edinburgh, UK

March. 2013 – Nov. 2017

**MSc Petroleum Engineering**, Heriot-Watt University, Edinburgh, UK

Aug. 2011 – Aug. 2012

**B.E. Oil and Gas Engineering**, China University of Petroleum

September. 2007 – July. 2011

## SELECTED PUBLICATIONS

1. Jin, C., Tanno, R., Mertzaniidou, T., Panagiotaki, E., and Alexander, D.C., [Learning to Downsample for Segmentation of Ultra-High Resolution Images](#). **ICLR 2022 (Accepted)**.
2. 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 (Under Review)**.
3. Jin, C., Tanno, R., Xu, M., Mertzaniidou, T. and Alexander, D.C., [Foveation for Segmentation of Ultra-High Resolution Images](#). **arXiv preprint 2020**.
4. Zhang, L., Tanno, R., Xu, M., Jin, C., Jacob, J., Ciccarrelli, O., Barkhof, F. and Alexander, D., [Disentangling Human Error from Ground Truth in Segmentation of Medical Images](#). **NeurIPS 2020**.
5. Jin, C., Tanno, R., Xu, M., Mertzaniidou, T. and Alexander, D.C., October. [Foveation for Segmentation of Mega-Pixel Histology Images](#). **MICCAI 2020**.
6. 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**.
7. Olga, F., Jin, C., Mertzaniidou, T., Alexander, D.C. and Bakal, C. Deep Neighbour-Based Multiple Instance Learning for Histopathology Image Classification. **Journal (Under Review)**.
8. Jin, C. and J. Ma, “Connectivity-enhancing fracture segmentation from X-ray Tomography (XRT) images of reservoir core samples by machine learning-based method”, **InterPore 2018**.
9. Jin, C., “Developing a hierarchical digital core analysis workflow for petro-physical characterisation of cross-laminated reservoir rocks at pore scales”, **Ph.D. thesis, 2017**, Heriot-Watt University, Edinburgh, UK.
10. Jin, C., J. Ma, J. Buckman, P. Zhang, and G. Couples, “Registering Scanning Electron Microscopy (SEM) and X-Ray Tomography (XRT) images for pore-grain characterisation of cross-laminated siliciclastic rock samples”, The **Geological Society Symposium 2017**.
11. Jin, C. and J. Ma, “Advanced fracture segmentation from X-ray tomography (XRT) images of reservoir core samples by machine learning-based centerline extraction”, **EAGE-SCA International Symposium 2016**.
12. Jin, C. and J. Ma, “An automated machine-learning procedure for robust classification of SEM images of cross-laminated sandstones for digital rock analysis”, **Society of Core Analysis (SCA) Symposium 2014**.

## AWARDS

- ☆ Scholarship for Outstanding International Student from Xinjiang (Top 20 in UK) in 2016
- ☆ James-watt scholarship of Heriot-Watt University from 2014 to 2016
- ☆ SINOPEC funding to study the uncertainty of Digital Rock Analysis from 2014 to 2016
- ☆ Science & Technology Innovation Award by China University of Petroleum (East of China) in 2008 and 2009
- ☆ Scholarship for the scientific and technological innovation in 2008 and 2009