Liang Chen

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Key Words: Machine Learning, Deep Learning, Computer Vision

Education

Imperial College London, London, UK

Ph.D., Computing Research, 2015.10 – 2018.12

- Thesis: Machine Learning in Medical Image Analysis
- Supervisors: Prof. Daniel Rueckert, Dr. Paul Bentley

M.Sc., Advanced Computing, 2012.09 – 2013.09

- Topic: Machine Learning, Computer Vision, Optimization
- Rank: *Distinction*

Nanjing University of Information Science & Technology, Nanjing, China

B.Sc., Information & Computing Science, 2008.09 – 2012.06

- Major: Computational Mathematics
- GPA: 90/100

Experience

Research Assistant, Imperial Collge London — 2014.01 to present

- Project: Decision-assist software for management of acute ischaemic stroke using brain-imaging machine-learning (Ref: II-LA-0814-20007, NIHR)
- Achievements:
  - Developed two fast and automated frameworks (based on *random forest* and *deep neural networks*, respectively) to quantify stroke-related imaging biomarkers, which perform as accurate as human experts;
  - Proposed a generic *deep neural network architecture* for medical image segmentation, outperforming the state-of-the-art;
  - Proposed a novel *self-supervised learning* method utilizing unannotated images to improve performance of models developed on limited annotated images;
  - Developed and deployed the pipelines to local hospitals, improving the accuracy and efficiency of stroke diagnosis;
  - Developed a *world largest* stroke imaging dataset, collaborating with clinicians, radiologists, medical students, etc.

Teaching Assistant, Imperial College London — Springs 2016, 2017

- CO317 - Graphics

Skills

Operation Systems:

- Linux, Windows, macOS

Programming Languages:

- Python, Matlab, C/C++

Deep Learning Frameworks:

- Tensorflow, Caffe

Languages:

- Mandarin, English

Awards

Silver Medal in Huawei UK Student Challenge 2017.11
- Task: Deep learning based image deblurring
- Approach: Multi-scale convolutional neural network

Undergraduate **First Class Scholarship** 2011, 2012

Honourable Mention in International Mathematical Contest in Modelling 2011.02

Second Prize in China Undergraduate Mathematical Contest in Modelling 2010.09

Service

Reviewer of IEEE Transactions on Medical Imaging

Publications

Paper Under Review

1. **Chen, L.**, Bentley, P., Mori, K., Misawa, K., Fujiwara, M., and Rueckert, D., "Self-supervised feature learning for medical image analysis."

Published Journal Papers

1. **Chen, L.**, Bentley, P., Mori, K., Misawa, K., Fujiwara, M., and Rueckert, D., "DRINet for medical image segmentation." *IEEE Transactions on Medical Imaging*, 37(11): 2453–2462, 2018.

2. **Chen, L.**, Jones, A., Mair, G., Patel, R., Gontsarova, A., Ganesalingam, J., Math, N., Dawson, A.C., Basaam, A., Cohen, D., Mehta, A., Wardlaw, J., Rueckert, D., and Bentley, P., "Rapid automated quantification of cerebral leukoaraiosis on CT." *Radiology*, 288(2): 573–581, 2018.

3. Qin, C., Guerrero, R., Bowles, C., **Chen, L.**, Dickie, D.A., Valdés-Hernández, M.C., Wardlaw, J., and Rueckert, D., "A large margin algorithm for automated segmentation of white matter hyperintensity." *Pattern Recognition*, 77: 150–159, 2018.

4. Guerrero, R., Qin, C., Oktay, O., Bowles, C., **Chen, L.**, Joules, R., Wolz, R., Valdés-Hernández, M.C., Dickie, D.A., Wardlaw, J., and Rueckert, D., "White matter hyperintensity and stroke lesion segmentation and differentiation using convolutional neural networks." *NeuroImage: Clinical*, 17: 918–934, 2018.

5. **Chen, L.**, Bentley, P., and Rueckert, D., "Fully automatic acute ischemic lesion segmentation in DWI using convolutional neural networks." *NeuroImage: Clinical*, 15: 633–643, 2017.

6. Maier, O., Menze, B.H., von der Gablentz, J., Häni, L., Heinrich, M.P., Liebrand, M., Winzeck, S., Basit, A., Bentley, P., **Chen, L.**, and others, "ISLES 2015-A public evaluation benchmark for ischemic stroke lesion segmentation from multispectral MRI." *Medical Image Analysis*, 35: 250–269, 2017.

7. Tong, T., Gray, K., Gao, Q., **Chen, L.**, Rueckert, D., and The Alzheimer's Disease Neuroimaging Initiative, "Multi-modal classification of Alzheimer's disease using nonlinear graph fusion." *Pattern recognition*, 63: 171–181, 2017.

8. Tong, T., Gao, Q., Guerrero, R., Ledig, C., **Chen, L.**, Rueckert, D., and The Alzheimer's Disease Neuroimaging Initiative, "A novel grading biomarker for the prediction of conversion from mild cognitive impairment to Alzheimer's disease." *IEEE Transactions on Biomedical Engineering*, 64(1): 155–165, 2017.

Conference Papers

1. Schlemper, J., Oktay, O., **Chen, L.**, Matthew, J., Knight, C., Kainz, B., Glocker, B., and Rueckert, D., "Attention-gated networks for improving ultrasound scan plane detection." *International conference on Medical Imaging with Deep Learning*, 2018.

2. **Chen, L.**, Tong, T., Ho, C.P., Patel, R., Cohen, D., Dawson, A.C., Halse, O., Geraghty, O., Rinne, P.E., White, C.J., and others, "Identification of cerebral small vessel disease using multiple instance learning." *International Conference of Medical Image Comupting and Computer-Assisted Intervention (MICCAI)*, 523–530, 2015.

Workshop Papers

1. **Chen, L.**, Bentley, P., and Rueckert, D., "A novel framework for sub-acute stroke lesion segmentation based on random forest." *Ischemic Stroke Lesion Segmentation*, 2015.

2. Kamnitsas, K., **Chen, L.**, Ledig, C., Rueckert, D., and Glocker, B., "Multi-scale 3D convolutional neural networks for lesion segmentation in brain MRI." *Ischemic Stroke Lesion Segmentation*, 2015.

3. Tong, T., Gray, K., Gao, Q., **Chen, L.**, and Rueckert, D., "Nonlinear graph fusion for multi-modal classification of Alzheimers disease." *International Workshop on Machine Learning in Medical Imaging*, 77–84, 2015.

References

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Dr. Paul Bentley, MA, MRCP, PhD
Clinical Senior Lecturer in Clinical Neuroscience — Phone: +44-(0)20 8846 7284
Honorary Consultant Neurologist — E-mail: p.bentley@imperial.ac.uk
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