Liang Chen

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Research Interests Medical Image Analysis, Computer Vision, Machine Learning

Education

Imperial College London, London, UK

Ph.D., Computing Research, *Expected:* Sep. 2018

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

M.Sc., Advanced Computing, Sep. 2013

- Topic: *Machine Learning, Computer Vision, Optimization*
- Rank: *Distinction*
- Supervisor: Prof. Daniel Rueckert

Nanjing University of Information Science & Technology, Nanjing, China

B.Sc., Information & Computing Science (Computational Mathematics), Jun. 2012

- GPA: *90/100*

Experience

Research Assistant Jan. 2014 to present

BioMedIA Group, Department of Computing,
Division of Brain Sciences, Department of Medicine,
Imperial College London

- Supervisors: *Prof. Daniel Rueckert, Dr. Paul Bentley*
- Project: *Decision-assist software for management of acute ischaemic stroke using brain-imaging machine-learning (Ref: II-LA-0814-20007, NIHR)*
- Achievements:
  - Developed a stroke imaging dataset (∼10,000 subjects), collaborating with clinicians, radiologists, medical students, etc.
  - Developed automated pipelines for image processing (scan joining, intra and inter subject registration, intensity normalization, etc.)
  - Developed novel algorithms for identification of stroke disease biomarkers (small vessel disease, acute ischemic infarct, atrophy, etc.) based on machine learning algorithms (random forest, boosting, deep neural networks, etc.)
  - Deployed the pipelines and algorithms to local hospitals with a software engineer

Teaching Assistant Springs 2016-2017

Department of Computing, Imperial College London

- CO317 - Graphics

Skills

Operation Systems:

- Linux, Windows, macOS

Programming Languages:

- Python (Knowledgeable), Matlab (Knowledgeable), C/C++ (Basic), Bash (Basic)

Deep Learning Frameworks:

- Tensorflow (Knowledgeable), Caffe (Knowledgeable)

Languages:

- Mandarin (Native), English (Professional)

Awards

Silver Medal — Nov. 2017
- Huawei UK Student Challenge
  Deep learning based image deblurring

First Class Scholarship — 2011-2012
- Nanjing University of Information Science & Technology

Honourable Mention — Feb. 2011
- International Mathematical Contest in Modelling (MCM)

Second Prize — Sep. 2010
- China Undergraduate Mathematical Contest in Modelling (CUMCM)

Service

Reviewer
- IEEE Transactions on Medical Imaging

Publications

Published Journal Papers

1. **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." 2018. To appear in *Radiology*.

2. 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.

3. 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.

4. **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.

5. 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.

6. 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.

7. 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.

Submitted Journal Paper

1. **Chen, L.**, Bentley, B., Mori, K., Misawa, K., Fujiwara, M., and Rueckert, D. "DRINet for medical image segmentation." 2018. Submitted to *IEEE Transactions on Medical Imaging*.

Conference Paper

1. **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.

Paper in Preparation

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

References

Prof. Daniel Rueckert, PhD, FREng, FIEEE, FMICCAI
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Imperial College London — E-mail: d.rueckert@imperial.ac.uk

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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