

DIAN LU (LYU 吕)

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EDUCATION

- Postdoc **Stanford University**; Behavioral and Cognitive Neuroscience Feb. 2022 - ongoing
Supervisor: Josef Parvizi
- Intracranial electroencephalography
 - Functional MRI (fMRI)
 - Intracranial electrical stimulation
- Ph.D. **University of Cambridge**; Clinical Neurosciences Oct. 2017-Nov. 2021
Fully-funded PhD; degree awarded with no correction
Supervisor: Dr. Emmanuel Stamatakis, Prof. David Menon
- Neuroimaging (fMRI, DTI)
 - Psychedelic and consciousness studies
- Summer **Cold Spring Harbor (Asia)**; Computational and Cognitive Neuroscience
School *Certificate awarded with a completed project* Aug. 2019-Sep. 2019
Project supervisor: Xiaojing Wang, John Murray
- Taught modules with practices include nonlinear dynamic system, dimensionality reduction, reinforcement learning and deep neural network
- M.Res. **University College London (UCL)**; Cognitive Neuroscience Sep. 2016-Jul. 2017
Degree awarded with Distinction
Supervisor: Dr. Sarah Gregory, Prof. Geraint Rees
- Neuroimaging (fMRI)
 - Huntington's disease
- Exchange **University of California, Berkeley**; Psychology Jan. 2014-Jan. 2015
program *GPA: 3.83/4.00*
- B.Sc. **China University of Political Science and Law (CUPL)**; Applied Psychology
Sep. 2011-Dec. 2013, Jan. 2015-Jul. 2015
Graduated with Distinction; GPA: 4.23/6.00 (above 85%)
- Dissertation project collaborated with Prof. Xiaolin Zhou's lab in the Dept. of Psychology of the Peking University (PKU)

PUBLICATIONS

- Lyu, D., Stieger, J. R., Xin, C., Ma, E., Lusk, Z., Aparicio, M. K., Werbaneth, K., Perry, C. M., Deisseroth, K., Buch, V., & Parvizi, J. (2023). Causal evidence for the processing of bodily self in the anterior precuneus. *Neuron*.
- Lyu, D., Naik, S., Menon, D. K., & Stamatakis, E. A. (2022). *Intrinsic brain dynamics in the Default Mode Network predict involuntary fluctuations of visual awareness*. *Nature Communications*, 13(1), Article 1.
<https://doi.org/10.1038/s41467-022-34410-6>
- Lyu, D., Pappas, I., Menon, D. K., & Stamatakis, E. A. (2021). *A Precuneal Causal Loop Mediates External and Internal Information Integration in the Human Brain*. *Journal of Neuroscience*.
<https://doi.org/10.1523/JNEUROSCI.0647-21.2021>

AWARDS & SCHOLARSHIP

CSC Cambridge Trust Scholarship

Oct. 2017-Oct.2020

To fully fund the current Ph.D. undertaken in the University of Cambridge

Government-Funded National University Student Innovation Program

- The 1st award was funded for the project titled *Effects of Communication Quality on the Doctor-Patient Relationship (2012-2013)*
- The 2nd award was funded for the project: *Cognitive Features of Eye Movement in Simultaneous Versus Sequential Eyewitness's Identification Procedures (2013-2014)*

2nd Prize Scholarship

Sep. 2013

Award for the Top-10 academically active students in the department

UNPUBLISHED RESEARCH PROJECTS

PhD research projects (Dept. of Clinical Neuroscience, U of Cambridge)

Computational simulation of propofol-anaesthetized brain state revealed stereotypical whole-brain functional connectivity

Aug. 2019-Sep. 2019

- **Objectives:** To construct a realistic computational model to fit the whole-brain functional connectivity as measured by resting-state fMRI, by employing mean-field neural mass model and structural connectivity discovered by diffusion MRI. With this biologically inspired model, to simulate the effect of propofol, a GABAergic anesthetic drug, that causes the brain to be unconscious.
- **Methods:** non-linear dynamic modelling with analytic approach to solve the system's state space; diffusion and functional MRI.
- **Results:** The simulated anathemized brain has a functional connectivity that resembles more the underlying structural connectivity than a "conscious" brain, hence yielding a more stereotypical connectivity pattern. This simulation result is partly supported by empirical data.

Stimulus-driven activations in the Supplementary Motor Area are preserved in Propofol-induced Anesthesia

Dec. 2018-Feb. 2019

- **Objectives:** To test the hypothesis that consciousness requires re-current neural activity, therefore stimulus-driven activation could be preserved while the top-down information transmission would be lost during unconscious states.
- **Methods:** Data from task-fMRI in a block-designed experiment of tennis-playing imagination (via auditory instruction); for whole-brain BOLD signals processing, used machine learning (linear SVR) to find the brain areas having distinct activations between a task block and a rest block; programmed with *Python (Scikit-Learn, SpaceNet, Nilearn etc.)*

Master's Research Project (Dept. of Neurology, UCL)

Default-Mode Network Connectivity in Huntington's Disease

Dec. 2016-Aug. 2017

- **Objectives:** To identify the vulnerable FC within the default mode network in the HD gene carriers comparing with the normal participants, and to associate the abnormal patterns in DMN connectivity with cognitive assessment scores and behavioral performance such as Sequential Finger Movement (SFM) task performance and Grip Force Variability (GFV)

Undergraduate Dissertation Project (Dept. of Cognitive Psychology, PKU)

Independent Factors of Good Intention and Cost in Helping Behaviour Do Not Dissociate Gratitude and Guilt Felt by the Beneficiary

Dec. 2014-Jun. 2015

- **Accomplishment:** A level (score 95%) dissertation

Government-Funded National University Student Innovation Program (the 2nd time) (School of Psychology, CUPL)

Cognitive Features of Eye Movement in Simultaneous Versus Sequential Eyewitness's Identification Procedures

2013-2014

- **Accomplishment:** Awarded 10,000 RMB, the highest-level funding for independent undergraduate research of the university

EXTRACURRICULAR ACTIVITIES

Volunteer in the Cardiovascular Department of Huangshi Puren Hospital

01/2015-03/2015

- Was trained with basic examinations (blood pressure, electrocardiogram etc.)
- Helped with patient examinations and care
- Helped with patient information logging and conversations with family members

International volunteer with the non-governmental organization (NGO) Program

***Palestine Summer Encounter* (<http://www.palestinesummer.org>)**

07/2014-08/2014

- filled in the job vacancies in the west bank of Palestine with suiting backgrounds, jobs included teaching assistant in The House of Hope (<http://www.hohbethlehem.org>) for helping the children with reduced mental abilities, research assistant for PTSD studies in the organization of Holy Land Trust (<http://www.holylandtrust.org>), editorial work for a local English news website (non-profit), and field work of collecting insect specimens for the building of the Palestine Museum of Natural History (<http://www.palestinenature.org>)

Volunteer in the Changyu Chuntong Infantile Autism Rehabilitation Center (<http://www.changyuchuntong.com/>)

09/2013-12/2013

- teaching assistant, helping the autistic children to learn rules and perform daily activities under the instruction of the psychologists in the center

Volunteer in the Chinese NGO program *Sun Village* (<http://www.sunvillage.com.cn/en/>)

09/2011-01/2012

- Accompanied and played with the orphaned children, and taught some of them dancing and playing the guitar