Chengrui Li 李成睿

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Research Interests

Computational neuroscience, neural latent variable models, statistical machine learning.
Eye tracking experiment and data analysis.
Fractional calculus signal processing.

Education

2021.08 – present
Ph.D. in Computational Science & Engineering.
M.Sc. in Mathematics on 2023.12.
Georgia Institute of Technology (Georgia Tech), Atlanta, USA.
GPA: **4.00**/4.00
Advisor: Prof. Anqi Wu

2018.08 – 2019.05
Non-Degree Exchange Student.
University of Tennessee, Knoxville (UTK), TN, USA.
GPA: **4.00**/4.00

2016.09 – 2020.06
B.Eng. in Software Engineering;
B.Sc. in Biological Sciences.
Wu Yuzhang Honors College, Sichuan University (SCU), Chengdu, China.
GPA: **3.94**/4.00; Rank: **1**/28
Advisor: Prof. Yifei Pu & Prof. Wei Deng
Thesis title: *The application of fractional order image enhancement in computational neuroscience*.

Honors and Awards

2023
Runner-up Poster Award in the Neuro Next Initiative Launch Event, Georgia Tech.

2020
Outstanding Undergraduate Thesis, SCU.
Outstanding Graduates, SCU.

2019
Finalist (<0.3%) + **Frank Giordano Award** (the only 1 out of 14,000), Mathematical Contest in Modeling (MCM/ICM), Consortium for Mathematics and Its Applications.

2018
"Tang Lixin" Lifetime Scholarship, Tang Lixin Education Development Foundation.
First Grade Scholarship, SCU.

2017
National Scholarship, Ministry of Education of the People's Republic of China.
First Grade College Mathematical Contest, SCU.

Research Publications

Peer Reviewed Conference Proceedings

C3 **Chengrui Li**, Yule Wang, Weihan, Li, and Anqi Wu. "Forward χ^2 Divergence Based Variational

Importance Sampling". *The Twelfth International Conference on Learning Representations (ICLR)*, 2024. [**spotlight 5%**]

C2 **Chengrui Li**, Soon Ho Kim, Chris Rodgers, Hannah Choi, and Anqi Wu. "One-hot Generalized Linear Model for Switching Brain State Discovery". *The Twelfth International Conference on Learning Representations (ICLR)*, 2024.

C1 Yule Wang, Zijing Wu, **Chengrui Li**, and Anqi Wu. "Extraction and Recovery of Spatio-Temporal Structure in Latent Dynamics Alignment with Diffusion Model". *Advances in Neural Information Processing Systems 35 (NeurIPS)*, 2023. [**Spotlight: 3%**]

Journal Articles

J1 **Chengrui Li** and Anqi Wu. "Inverse Kernel Decomposition". *Transactions on Machine Learning Research (TMLR)*, 2023. [under review]

Preprints

P1 **Chengrui Li** and Bruce J. MacLennan. "Continuous-time systems for solving 0-1 integer linear programming feasibility problems". *arXiv:1905.04612*, 2019.

Invited Talks and Other Presentations

2024.02 **Chengrui Li**, Soon Ho Kim, Chris Rodgers, Hannah Choi, and Anqi Wu. "One-hot Generalized Linear Model for Switching Brain State Discovery". Poster presentation @ The 20th anniversary of Computational and Systems Neuroscience (COSYNE 2024), Lisbon, Portugal.

Yule Wang, Zijing Wu, **Chengrui Li**, and Anqi Wu. "Extraction and recovery of spatio-temporal structure in neural alignment via diffusion models". Poster presentation @ The 20th anniversary of Computational and Systems Neuroscience (COSYNE 2024), Lisbon, Portugal.

2023.10 **Chengrui Li**, Soon Ho Kim, Chris Rodgers, Hannah Choi, and Anqi Wu. "One-hot Generalized Linear Model for Switching Brain State Discovery". Poster presentation @ Neuro Next Initiative Launch Event, Georgia Tech.

2023.08 **Chengrui Li**. "Latent Variable Models for Neural Spike Train Data". Invited talk @ Affiliated Mental Health Center, Zhejiang University School of Medicine (Hangzhou Seventh People's Hospital), Hangzhou, China.

2018.12 **Chengrui Li** and Wei Deng. "The Power and Beauty of Mathematics: A Prospect of Nature Inspiration & Computational Model from the Interdisciplinary View". Oral presentation @ *The 11th International Conference on Brain Informatics (BI 2018)*, Arlington, TX, USA.

Miscellaneous Experience

Teaching Experiences

Fall 2023 **Teaching assistant**. CSE 6740 Computational Data Analysis @ Georgia Tech.

Spring 2023 **Teaching assistant**. CSE 6740 Computational Data Analysis @ Georgia Tech.

Summer Schools

2020.08 **CNeuro 2020: Theoretical and Computational Neuroscience Summer School**, Tsinghua University.

2018.08 **The Chinese University of Hong Kong Summer Workshop**, Hong Kong SAR, China.

2018.07 **Cognitive Neuroscience Summer School**, Peking University.

Other Research Experiences

2018.09 – 2019.10 **Eye tracking experiment: Response Selection**. Designed the eye-tracking program by Experiment Builder. Completed an eye-tracking data analysis program in MATLAB. Used the eye-tracking technique to investigate the influence of different stimulus-response conditions on the eye movement trajectories.

2019.07 **Web project development**. Developed a web project for an e-commerce platform under the SSM framework. Java + MySQL + JSP was used for full-stack agile development.

2018.02 **Clinical internship at the State Key Laboratory of Biotherapy, West China Hospital, SCU**. Conducted tests including the Mini-Mental State Examination (MMSE), the Montreal Cognitive Assessment (MoCA), the Hamilton Anxiety Rating Scale (HAM-A), and the Hamilton Depression Rating Scale (HAM-D).

Skills and Hobbies

Machine Learning/Math Programming: Python, MATLAB, Mathematica, R, Julia.
Development Programming: C/C++, Java, SQL.
Multi-Media: Cinema 4D, Adobe Premiere Pro, Adobe Illustrator, Adobe Audition, etc.
Others: Experiment Builder (eye-tracking), LaTeX, Linux, etc.
Hobbies: Violin, Piano, Magic tricks, YOYO ball, Aerial photograph & film/audio post-processing, etc.