Chengrui Li 李成睿

cnlichengrui@gatech.edu
https://JerrySoybean.github.io
https://scholar.google.com/citations?user=SXR3RXIAAAAJ
https://github.com/JerrySoybean

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

2016.09 – 2020.06
B.Eng. in Software Engineering (Computational Biology);
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*.

Employment

2024.05 – 2024.08
Research Internship, Neuromoter Interfaces: Computational Modeling, CTRL-Labs, Meta Reality Labs, New York City, USA.
Advised by Dr. Eftychios Pnevmatikakis in the EMG Foundations team.

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

C5 "A Differentiable Partially Observable Generalized Linear Model with Forward-Backward Message Passing"
Chengrui Li, Weihan Li, Yule Wang, and Anqi Wu
The Forty-first International Conference on Machine Learning (ICML), 2024 [under review]

C4 "Multi-Region Markovian Gaussian Process: An Efficient Method to Discover Directional Interactions Across Multiple Brain Regions"
Weihan Li, **Chengrui Li**, Yule Wang, and Anqi Wu
The Forty-first International Conference on Machine Learning (ICML), 2024 [under review]

C3 "Forward χ^2 Divergence Based Variational Importance Sampling"
Chengrui Li, Yule Wang, Weihan Li, and Anqi Wu
The Twelfth International Conference on Learning Representations (ICLR), 2024 [**spotlight 5%**]

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

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

Journal Articles

J2 "Multiscale Heterogeneous Fusion Network for Hyperspectral Image Classification"
Zhi Li, Lianru Gao, Ke Zheng, Jiaxin Li, and **Chengrui Li**
IEEE Transactions on Geoscience and Remote Sensing, 2023 [under review]

J1 "Inverse Kernel Decomposition"
Chengrui Li and Anqi Wu
Transactions on Machine Learning Research (TMLR), 2024 [under review]

Abstracts

A1 "Similarity of Memory Representations Modulate Saccade Curvatures"
Golnaz Forouzandehfar, **Chengrui Li**, Aaron T. Buss, and A. Caglar Tas
Journal of Vision, 2024
Poster presentation @ *Vision Science Society (VSS) 2024, St. Pete Beach, Florida, USA*

Preprints

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

Theses

T1 "The application of fractional order image enhancement in computational neuroscience"
Chengrui Li, Wei Deng, and Yifei Pu

Sichuan University Undergraduate Thesis, 2020 [**Outstanding Undergraduate Thesis**]

Invited Talks and Other Presentations

2024.02
- "One-hot Generalized Linear Model for Switching Brain State Discovery"
  Chengrui Li, Soon Ho Kim, Chris Rodgers, Hannah Choi, and Anqi Wu
  Poster presentation @ *The 20th anniversary of Computational and Systems Neuroscience (COSYNE 2024), Lisbon, Portugal*
- "Extraction and recovery of spatio-temporal structure in neural alignment via diffusion models"
  Yule Wang, Zijing Wu, **Chengrui Li**, and Anqi Wu
  Poster presentation @ *The 20th anniversary of Computational and Systems Neuroscience (COSYNE 2024) Lisbon, Portugal*

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

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

2018.12
- "The Power and Beauty of Mathematics: A Prospect of Nature Inspiration & Computational Model from the Interdisciplinary View"
  Chengrui Li and Wei Deng
  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.