

李成睿 Chengrui Li

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Research Interests

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

Education

- 2021.08 – present 📖 **Ph.D. in Computational Science & Engineering.**
M.Sc. in Mathematics in 2023.12.
Got the offer in 2020.08 but deferred to 2021.08 due to COVID-19.
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**, Neuromotor Interfaces: Computational Modeling, CTRL-Labs, Meta Reality Labs, New York City, USA.
Advised by Dr. Sean Bittner 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.

Research Publications

Peer Reviewed Conference Proceedings

- C7** “A Revisit of Total Correlation in Disentangled Variational Auto-Encoder with Partial Disentanglement”
Chengrui Li, Yunmiao Wang, Yule Wang, Weihai Li, Dieter Jaeger, and Anqi Wu
The Thirteenth International Conference on Learning Representations (ICLR), 2025 [under review]
- C6** “Exploring Behavior-Relevant and Disentangled Neural Dynamics with Generative Diffusion Models”
Yule Wang, **Chengrui Li**, Weihai Li, and Anqi Wu
Advances in Neural Information Processing Systems 36 (NeurIPS), 2024
- C5** “A Differentiable Partially Observable Generalized Linear Model with Forward-Backward Message Passing”
Chengrui Li, Weihai Li, Yule Wang, and Anqi Wu
The Forty-first International Conference on Machine Learning (ICML), 2024
- C4** “Multi-Region Markovian Gaussian Process: An Efficient Method to Discover Directional Interactions Across Multiple Brain Regions”
Weihai Li, **Chengrui Li**, Yule Wang, and Anqi Wu
The Forty-first International Conference on Machine Learning (ICML), 2024
- C3** “Forward χ^2 Divergence Based Variational Importance Sampling”
Chengrui Li, Yule Wang, Weihai 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, Zijiang Wu, **Chengrui Li**, and Anqi Wu
Advances in Neural Information Processing Systems 35 (NeurIPS), 2023 [Spotlight: 3%]

Journal Articles

- J2** “Cross Semantic Heterogeneous Modeling Network for Hyperspectral Image Classification”
Zhi Li, Ke Zheng, Jiabin Li, **Chengrui Li**, and Lianru Gao
IEEE Transactions on Geoscience and Remote Sensing, 2024
- J1** “Inverse Kernel Decomposition”
Chengrui Li and Anqi Wu
Transactions on Machine Learning Research (TMLR), 2024

Abstracts

- A1** “Similarity of Memory Representations Modulate Saccade Curvatures”
Golnaz Forouzandehfar, **Chengrui Li**, Aaron T. Buss, and A. Caglar Tas
Journal of Vision, 2024

Preprints






P2 “Markovian Gaussian Process: A Universal State-Space Representation for Stationary Temporal Gaussian Process”
Weihan Li, Yule Wang, **Chengrui Li**, and Anqi Wu
arXiv:2407.00397, 2024

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 2022  **Graduate student research mentor.** SURE @ 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).

Academic Services

Reviewer

Neural Information Processing Systems (NeurIPS) 2023, 2024
 International Conference on Machine Learning (ICML) 2023, 2024
 International Conference on Learning Representations (ICLR) 2024, 2025
 Association for the Advancement of Artificial Intelligence (AAAI) 2025

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.