Chengyue Huang

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Education

Renmin University of China (RUC)   Beijing, China
Bachelor of Science, School of Statistics, Major in Applied Statistics   *Sept. 2019 - June 2023*
- **GPA:** 3.83/4.00 (Top 8% in 121)
- **Maths and Stats Courses:** Mathematical Analysis, Advanced Algebra, Probability, Mathematical Statistics, Regression Analysis, Time Series Analysis, Stochastic Process, Convex Optimization
- **CS Courses:** C&C++ Programming, Data Structure and Algorithm, Machine Learning, Deep Learning, Database System

Research Interests

- **Machine learning from mathematical and statistical principles** (e.g. XAI, statistical ML)
- **Applying statistical and machine learning methods to various fields** (e.g. AI4Sci, music, etc.)

Publications

* indicates equal contribution
- **C. Huang***, Y. Nie*, H. Liang, and H. Xu. Adversarial and Implicit Modality Imputation with Applications to Depression Early Detection. *CAAI International Conference on Artificial Intelligence (CICAI)*, 2022. [Paper]
- N. T. Huang, S. Villar, C. Priebe, D. Zheng, **C. Huang**, L. Yang, and V. Braverman. From local to global: Spectral-inspired graph neural networks. In *NeurIPS 2022 Workshop: New Frontiers in Graph Learning*, 2022. [Paper]

Research Experience

From Local to Global: Spectral-Inspired Graph Neural Networks   AMS, JHU (Remote)
*Research Assistant, advised by Prof. **Carey Priebe** and Ph.D. student Teresa Huang*   *June 2022 - Sept. 2022*
- Mitigated over-smoothing and over-squashing issues in deep GNNs by proposing a normalization technique in message-passing algorithms (`PowerEmbed`) to encode global spectra information inspired by spectral embeddings.
- Performed comprehensive studies on 10 real-world graph benchmark datasets and simulated random graphs following the 2-block stochastic block models, with respect to different methods (spectral or message-passing), graph topology (homophily or heterophily), graph density, and number of layers of the methods.
- Demonstrated the superiority and robustness of `PowerEmbed` both theoretically and empirically compared to pure spectral methods (e.g. ASE) and recent deep GNN baselines (e.g. GCNII and GPR-GNN).

Study on GNN Models for Multi-modal Social Network Data   STAT, RUC
*Member, advised by Prof. **Xiaoling Lu***   *Feb. 2022 - Present*
- Exploited multi-modal contents to enhance multimedia recommendation on TikTok dataset using GNN.
- Improved the fusion process of 3 modalities (visual, acoustic, and textual) based on cross-modality attention mechanism, explored how information interchange on various modalities reflects users' preferences.

Adversarial Multi-modal Imputation for Disease Prediction   GSAI & SPAP, RUC
*Member, advised by Prof. **Hongteng Xu** and Prof. **Hailun Liang***   *June 2021 - May 2022*
- Resolved the modality-missing issue by proposing an implicit imputation method (`AIMI`) with multi-modal representation learning via auto-encoding, clustering based on CPM-Net, adversarial networks and a feedback loop.
- Applied our model to the real-world depression early detection task based on the UK Biobank database, which contains 480,000 EHRs with 8 modalities including blood, metabolism, urine, gene, etc.
- Investigated the competitiveness of `AIMI` by comparing it with various typical multi-modal data imputation baselines under different missing rates, which demonstrates its stability when facing severe missing problem.

Honors and Awards

- Second Prize Scholarship (Top 8%)   *2019 - 2020 & 2020 - 2021*
- First Prize in Chinese Mathematics Competitions (Top 8%)   *2020*
- First Prize (Beijing Region) in China Undergraduate Mathematical Contest in Modeling (Top 10%)   *2021*

Co-curricular and Extra-curricular Learning

- **Conference:** Attended the 2022 CAAI International Conference on Artificial Intelligence and presented our poster.
- **Association:** As a member of Capital of Statistics, interviewed Prof. Hongzhe Li from UPenn about biostatistics.
- **Volunteering:** Remote volunteer math teacher of 7th graders in Yuji Middle School, Liaocheng, Shandong, China.
- **Sports:** School Female Volleyball Team, main player; RUC 10km Challenge, 56min13s (women top 70)
- **Music:** Performed street music as the vocal of *Fishes in Carnegie* [link]; music blogger on Bilibili (Chinese YouTube) [link]

Others

- **Programming Skills:** Python (PyTorch, Scikit-learn, etc.), C/C++, SQL, LaTeX, R
- **Language:** TOEFL 105 (R29+L26+S24+W26); GRE V152+Q170+AW3.5
- **Referees: JHU:** Prof. Carey Priebe, AMS; **RUC:** Prof. Hongteng Xu, GSAI; Prof. Hailun Liang, SPAP; Prof. Xiaoling Lu, STAT