Chin-Hui **Chen**

PhD candidate, Neuroscience, Virginia Tech

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Summary

PhD candidate in the School of Neuroscience at Virginia Tech, specializing in computational neuroscience with a focus on brain–computer interfaces (BCI), sleep, and memory.

Research Interests

Computational Neuroscience, Sleep and Memory, Bio-inspired Memory Models.

Education

Ph.D. Neuroscience — *Blacksburg, VA, USA*

Virginia Tech, GPA 3.97 — *2022 - current*

- Neural Dynamics and Neural Engineering Lab. Advisor: Dr. Sujith Vijayan.
- Targeted memory reactivation and biophysical models in brain-computer interfaces.
- Research in sleep and memory using EEG and iEEG.
- Phase-locked sleep oscillation algorithm.

M.S. Computer Science — *Taipei, Taiwan*

National Taiwan University, GPA 4.00 — *2013*

- Information Retrieval and Data Mining Lab. Advisor: Dr. Pu-Jen Cheng.
- Machine learning on time series data (support vector machine and neural network).
- Data mining on CDC public health data. (clustering algorithm)

B.S. Computer Science — *Taipei, Taiwan*

National Taiwan University, GPA 3.80 — *2009*

- 7 of 120 students in terms of final GPA for 2006 spring semester.
- 8 of 120 students in terms of final GPA for 2007 spring semester.
- 15 of 100 students in terms of overall semesters.

Experience

Neural Dynamics and Neural Engineering Lab, Virginia Tech — *Blacksburg, VA, USA*

Research Technician, Advisor: Prof. Sujith Vijayan — *2021 - 2022*

- EEG / iEEG data collection and analysis.
- Design brain computer interface task.

Center for Research in Cognitive Science, National Chung Cheng University — *Chiayi, Taiwan*

Research Assistant, Advisor: Prof. Chon-Wen Gary Shyi, Prof. Shih-Tseng Tina Huang — *2019 - 2020*

- Dynamic Causal Modeling for fMRI/MEG/EEG.
- MEG data collection, preprocessing and analysis (brainstorm, fieldtrip).

Machine Discovery Lab, National Taiwan University — *Taipei, Taiwan*

Research Assistant, Advisor: Prof. Shou-De Lin — *2017 - 2019*

- Memory augmented neural network research.
- Memory-based and relational-based model for natural language reasoning (NLR) tasks.

Skysource and HopeBay Tech, Data Science and Cloud Computing Company — *Taipei, Taiwan*

Data Engineer — *2013 - 2017*

- Data warehouse ETL Process (MSSQL and SSIS).
- Distributed database cluster (MariaDB and MongoDB cluster).

Teaching Experience

School of Neuroscience, Virginia Tech — *Blacksburg, VA, USA*

Graduate Teaching Assistant, NEUR-2036 Neuroscience Laboratory, Instructor: Dr. Dylan McDaniel — *Spring 2025*
- On-site GTA assistance - 4 sections, grading and lab preparation, 129 students.

Graduate Teaching Assistant, NEUR-2035 Neuroscience Laboratory, Instructor: Dr. Zhuo Fu — *Spring 2024*
- Lab preparation and on-site GTA assistance, 95 students.

Graduate Teaching Assistant, NEUR-4034 Diseases of the Nervous System, NEUR-2464 Neuroscience and Society, Instructor: Dr. Kristin F. Phillips — *Fall 2023*
- Assignments (NEUR-2464, 95 students)
- Team project grading (NEUR-4034, 39 students)

Graduate Teaching Assistant, NEUR-2035 Neuroscience Laboratory II, Instructor: Dr. Zhuo Fu — *Spring 2023*
- Lab preparation and Zoom TA assistance, 72 students.

Graduate Teaching Assistant, NEUR-2036 Neuroscience Laboratory I, Instructor: Dr. Dylan McDaniel — *Fall 2022*
- Lab report grading and on-site GTA assistance, 79 students - 43 in-person, 36 virtual.

Computer Science, National Taiwan University — *Taipei, Taiwan*

Teaching Assistant, DM and ML: Theory and Practice, Instructor: Dr. Shou-De Lin — *2018*
- Teamed up with students for ACM KDD CUP 2018.

Teaching Assistant, Web Search and Mining, Instructor: Dr. Pu-Jen Cheng — *2010*
- Assignments preparation. (handwriting assignments)

Teaching Assistant, Web Search and Mining, Instructor: Dr. Pu-Jen Cheng — *2009*
- Assignments preparation. (Lucene, Nutch, document classification and clustering)

Conference Abstracts

Chin-Hui Chen, Kyle LePage, Jarod Le, Jeremy Decker, Sujith Vijayan. Effectiveness of Intensity Modulation in Closed-Loop Acoustic Stimulation During Naps. SLEEP Meeting (2025).

Chin-Hui Chen, Connor Guarniere, Sujith Vijayan. Sleep and Brain Computer Interface. VT Diversifying Science Research Mixer (2024).

Yunruo Ni, Jeremy Decker, Chin-Hui Chen, Eliza Overlock, Sujith Vijayan. Optimizing sounds for enhancing sleep neural dynamics by auditory stimulation. Translational Biology, Medicine, & Health Graduate Program Oral Presentation (2024).

Laura B. Murdaugh, Brieann Brown, Chin-Hui Chen, Yuyang Dong, Cristina Miliano, Starlina Shepard, Sujith Vijayan, Ann M. Gregus, Matthew W. Buczynski. Evaluation of cognitive function in male and female mice using the Feeding Experimentation Device v3 (FED3). Society for Neuroscience (SfN 2023).

Starlina Shepard, Laura B. Murdaugh, Chin-Hui Chen, Sujith Vijayan, Ann M. Gregus, Matthew W. Buczynski. Effects of the FAAH P129T mutation in mice on operant responding using FED3. Dennis Dean Undergraduate Research and Creative Scholarship Conference (2023).

Connor Guarniere, Chin-Hui Chen, Andrew Kvavilashvili, Sujith Vijayan. Sleep and BMI Learning. 3rd Annual Fralin Biomedical Research Institute SURF Symposium (2022).

Shih-Tseng Tina Huang, Gary C.-W. Shyi, Chin-Hui Chen, Yen-Ju Lu. Cross-Modal Processing and Integration in Detecting and Discriminating Basic Emotions: A MEG Study. International Congress of Psychology (ICP 2020).

Gary C.-W. Shyi, Shih-Tseng Tina Huang, Joshua O. S. Goh, Jeremy C.-C. Lee, Ya-Yun Chen, Chin-Hui Chen, Wan-Ting Hsieh, Felix F.-S. Tsai, Chi-Chuan Chen. Neural Modeling and Computational Approaches to Investigating the Brain Mechanisms Underpinning Emotional Expression Processing of East-Asian Faces. Society for Neuroscience (SfN 2019).

Ya-Yun Chen, Chi-Chuan Chen, Yu Song Haw, Chin-Hui Chen, Joshua O. S. Goh, Shih-Tseng Tina Huang, Gary C.-W. Shyi. Neural Correlates of Emotional Expression Processing of East-Asian Faces: An fMRI and Dynamic Causal Modeling Investigation. Vision Sciences Society (VSS 2019).

Peer-Reviewed Articles

Chin-Hui Chen, Kyle LePage, Jarod Le, Jeremy Decker, Sujith Vijayan. Effectiveness of Intensity Modulation in Closed-Loop Acoustic Stimulation During Naps. (to be submitted in the end of 2025).

Chin-Hui Chen, Jeremy Decker, Mark R. Witcher, Sujith Vijayan. Neural Dynamics of Sleep-Mediated Learning in Brain-Computer Interfaces. (to be submitted in the end of 2026).

Laura B. Murdaugh, Brieann Brown, Chin-Hui Chen, Cristina Miliano, Yuyang Dong, Starlina Shepard, Jason W. Putnam, Christine L. Faunce, Luis A. Natividad, Sujith Vijayan, Ann M. Gregus, Matthew W. Buczynski. Examining Cognitive Performance in Mice using the Open-Source Operant Feeding Device FED3. (2024) (submitted). biorxiv.org github.com

Chin-Hui Chen*, Yi-Fu Fu*, Hsiao-Hua Cheng and Shou-de Lin. Unseen Filler Generalization In Attention-based Natural Language Reasoning Models. IEEE International Conference on Cognitive Machine Intelligence (IEEE CogMI 2020) (Peer-Reviewed). ieee.org github.com

Pei-Ying Huang, Hsin-Yu Liu, Chin-Hui Chen, Pu-Jen Cheng. The Impact of Social Diversity and Dynamic Influence Propagation for Identifying Influencers in Social Networks. IEEE/WIC/ACM International Conference on Web Intelligence (IEEE/ACM WI 2013) (Peer-Reviewed, Acceptance Rates 25%). ieee.org

Che-An Lu, Chin-Hui Chen, Pu-Jen Cheng. Clustering and Visualizing Geographic Data Using Geo-tree. IEEE/WIC/ACM International Conference on Web Intelligence (IEEE/ACM WI 2011) (Peer-Reviewed, Acceptance Rates 21%). ieee.org

Chia-Jung Lee, Chin-Hui Chen, Shao Hang Kao, Pu-Jen Cheng. To translate or not to translate? International ACM SIGIR Conference on Research and Development in Information Retrieval (ACM SIGIR 2010) (Peer-Reviewed, Acceptance Rates 17%). acm.org

Outreach

Explore Life Sciences Camp, College of Science, VT *Blacksburg, VA, USA*
STAFF *2025*
- Participated in the ”Brain Games” sessions for the College of Science Explore Sciences camps.
- Engaged with 9th to 12th graders as part of the ”Explore Science” camp. We integrated brain-computer interface and EEG headset applications into the the camp’s activities.

Sleep Exhibition in Science Museum of Western Virginia *Roanoke, VA, USA*
ORGANIZER TEAM *2024 - 2025*
- Participated in organizing the Sleep Exhibition (NSF grant).
- My role involved discussing neuroscience and sleep concepts, proposing sleep materials for the exhibition.

Virginia Tech Science Festival 2024 *Blacksburg, VA, USA*
LEADER IN ORGANIZER TEAM *2024*
- Participated in the ”Use your brain waves to play a game” session.
- This family-friendly expo-style event attracts 2,000 to 5,000 visitors, including families, school groups, and Virginia Tech students.
- My role involved developing a Mario-style BCI game and designing the event booth..

Explore Sciences Camps, College of Science, VT *Blacksburg, VA, USA*
STAFF *2024*
- Participated in the ”Brain Game” sessions for the College of Science Explore Sciences camps.
- Engaged with 9th to 12th graders as part of the ”Explore Science” camp. My role involved presenting attention-based brain games and contributing to the design of the camp’s activities.

Flip the Fair *Roanoke, VA, USA*
PRESENTER *2024*
- Participated in “Flip the Fair 2024” at the Roanoke Public Libraries.
- Presented neuroscience research posters to 5th-grade students, who then served as judges. The poster I presented was titled ”A good sleep makes you learn better.”

Explore Sciences Camps, College of Science, VT *Blacksburg, VA, USA*
STAFF *2023*
- Participated in the ”Psychology and Neuroscience” sessions for the College of Science Explore Sciences camps.
- Engaged with 9th to 12th graders as part of the ”Explore Science” camp. My role involved presenting neuroscience concepts and interactive games, leading sessions on ”Psychology and Neuroscience,” and contributing to the design of the camp’s activities.

Flip the Fair *Roanoke, VA, USA*
PRESENTER *2023*
- Participated in “Flip the Fair 2023” at the Roanoke Public Libraries.
- Presented neuroscience research posters to 5th-grade students, who then served as judges. The poster I presented, co-authored with Ya-Yun Chen, was titled ”How Being in Sync with Your Parents and Good Sleep Make You Feel and Learn Better.”

Presentations

Steger WiPC, Virginia Tech
CHIN-HUI CHEN *2025*
- Presenter for “Neural Dynamics of Sleep-Mediated Learning in Brain-Computer Interfaces” research

41st Annual GPSS Research Symposium, Virginia Tech
CHIN-HUI CHEN *2025*
- Presenter for “Investigating the Role of Intensity in Closed-Loop Auditory Stimulation” research

SoN Working Progress, Virginia Tech
CHIN-HUI CHEN *2024*
- Presenter for “Neural Dynamics of Sleep-Mediated Learning in Brain-Computer Interfaces” research

Affective Neurodynamics and Development Lab, Virginia Tech
CHIN-HUI CHEN *2024*
- Presenter for “Targeted Memory Reactivation in Motor-based Brain-Computer Interface Applications” research.

IEEE Cognitive Machine Intelligence
CHIN-HUI CHEN*, YI-FU FU*. *2020*
- Presenter for “Unseen Filler Generalization In Attention-based Natural Language Reasoning Models” paper.

Center for Research in Cognitive Science, National Chung Cheng University
CHIN-HUI CHEN, YA-YUN CHEN. *2020*
- Presenter for Dynamic causal models (DCM) for fMRI/MEG tutorial.

Center for Research in Cognitive Science, National Chung Cheng University
CHIN-HUI CHEN *2020*
- Presenter for an in-depth tutorial on the use of MEG brainstorm tool.

Research Center for Education and Mind Sciences, National Tsing Hua University
YA-YUN CHEN, CHIN-HUI CHEN *2019*
- Presenter for Dynamic causal models (DCM) for fMRI tutorial.

Guest Lecture in Special Topics in Machine Learning course, National Taiwan University
CHIN-HUI CHEN *2018*
- Delivered a guest lecture on machine reasoning topic.

MSLAB-Emotibot workshop, National Taiwan University
CHIN-HUI CHEN *2017*
- Presented an overview of deep reasoning models.

HopeBay Tech TechFriday Club
CHIN-HUI CHEN *2016*
- Presenter for Introduction to deep learning talk.

Honors & Awards

2025 **Government Scholarships to Study Abroad - 32,000 USD**, Ministry of Education, Taiwan
2025 **Travel Award**, School of Neuroscience, Virginia Tech, USA
2018 **Honorable Prizes**, ACM KDDCUP 2018. 7th place over 4000 teams
2009 **The Excellent Teaching Assistant Award**, National Taiwan University, Taiwan
2009 **Special Award**, Yahoo!
2008 **Mobile Communication Award**, Yahoo!

Mentorship

Wayne Kuo	Lab Volunteer, Spring 2025 - Summer 2025
Songlin Liu	Undergraduate, Spring 2025
Abhisheik Sharma	Undergraduate, Spring 2025
Jarod Le	VT PREP, Lab Technician, Fall 2023 – Summer 2025
Richa Prakash	Undergraduate, Fall 2023 - Spring 2025
Matthew Hoffman	Undergraduate, Fall 2023 - Fall 2024
Sarah Zhang	Neuroscience Rotation, Fall 2024
Yunruo Ni	TBMH Graduate Student Rotation, Spring 2024
Ashil Amin	Undergraduate, Spring 2024
Martha-Patience Taah	NeuroSURF Program, Undergraduate, Fall 2023 – Fall 2024
Harshini Venkat	Undergraduate, Fall 2023 – Spring 2024
Eliza Overlock	Undergraduate, Fall 2023 – Spring 2024
Leah Lee	Undergraduate, Spring 2023 – Spring 2024
Linda Maingua	Undergraduate, Spring 2023 – Fall 2023
Vyan Shah	Undergraduate, Spring 2023 – Fall 2023
Connor John Guarniere	NeuroSURF Program, Undergraduate, Summer 2022 – Spring 2023

Professional Membership

American Academy of Sleep Medicine	Member 2025
Society for Neuroscience DCMA Chapter	Member
IEEE Computer Society	Member 2020