Chun-Shu Wei

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Short Biography

Dr. Chun-Shu Wei received the Ph.D. degree in Bioengineering from the University of California San Diego (UCSD), USA, in 2017. In 2018-2019, he worked as Postdoctoral Fellow at the School of Medicine, Stanford University, USA. He was an exchange student at the University of Illinois at Urbana-Champaign (UIUC) in 2008, a research intern at Academia Sinica, Taiwan, and at Mitsubishi Electric Research Laboratories (MERL), USA, in 2016 and 2017, respectively. He is currently an assistant professor (Hwa Tse Roger Liang Junior Chair Professor) in the Department of Computer Science and a joint assistant professor in the Institute of Education and the Institute of Biomedical Engineering at National Yang Ming Chiao Tung University (NYCU), Taiwan. His research interests include brain-computer interface, artificial intelligence and biomedical signal processing. He currently serves as an associate editor for the *Frontiers in Computational Neuroscience* and an academic editor for *PLOS ONE*.

Research Interests

- Brain-computer interface
- Biomedical signal processing
- Computational neuroscience
- Machine learning
- Cognitive engineering

Education

University of California San Diego, CA, USA

    Ph.D. in Bioengineering   Sep 2012 – Dec 2017

National Chiao Tung University, Taiwan

    M.S. in Electrical and Control Engineering   Sep 2009 – Jun 2011

    B.S. in Electrical Engineering and Computer Science (EECS)   Sep 2005 – Jun 2009

University of Illinois at Urbana-Champaign, IL, USA

    Exchange undergraduate student   Aug 2008 – Dec 2008

Experience

National Yang Ming Chiao Tung University, Taiwan

    Assistant Professor, Computer Science   Aug 2020 – Present

National Yang Ming Chiao Tung University, Taiwan

    Joint Assistant Professor, Biomedical Engineering   Aug 2022 – Present

National Chiao Tung University, Taiwan

    Joint Assistant Professor, Education   Aug 2020 – Present

University of California San Diego, USA

    Visiting Professor   Jun 2021 – Aug 2021

National Chiao Tung University, Taiwan

    Joint Assistant Professor, Electrical and Computer Engineering   Feb 2020 – Jan 2022

National Chiao Tung University, Taiwan

    Assistant Professor, Education   Aug 2019 – Jul 2020

Stanford University, CA, USA

    Postdoctoral Fellow, Psychiatry and Behavioral Sciences   Nov 2018 – Jul 2019

University of California San Diego, USA

    Postdoctoral Researcher, Neural Computation   Jan 2018 – Nov 2018

Mitsubishi Electric Research Laboratories (MERL), MA, USA

    Research Intern, Mind Sensing Project   Jun 2017 – Sep 2017

Academia Sinica, Taiwan

    Research Intern   Nov 2016 – Jan 2017

Selected Honors and Awards

Higher Education Academy (HEA) Fellowship	2022
UCSD J. Yang Visiting Scholar Fellowship	2021
NYCU Award for Outstanding Student Mentoring	2021
NCTU Hwa Tse Roger Liang Junior Chair Professor	2019
Best Paper Award Finalist - IEEE/EMBS Conference of Neural Engineering (NER)	2019
NATPA-SCAL Prof. Frank T. Shu Scholarship	2018
IEEE SMC Student Travel Award	2015
UC San Diego Graduate Student Travel Award	2015
NCTU EE Hsiao Yuan Long Scholarship (1 out of 123)	2011
NCTU Academic Excellence Award	2010
NCTU Scholarship of Overseas Exchange Program	2008
Honorable Mentions in Earth Science, Taiwan National Science Competition	2004

Professional Activities

Associate/Academic Editor

- *Frontiers in Computational Neuroscience*
- *PLOS One*

Registration Chair/Local Arrangement Chair

- *International Conference on Fuzzy Theory and Its Applications, Hsinchu, Taiwan, November 6-7, 2020 (iFuzzy 2020)*

Session Chair/Moderator

- *The 14th International ACM Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutoUI 2022) - Workshop on Multimodal Motion Sickness Detection and Mitigation Strategies for Car Journeys*
- *The 15th IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC-2022) - Special Track: Embedded Neuroprosthetics, Technologies, and Devices*
- *IEEE Symposium on Computational Intelligence for Brain Computer Interfaces (SSCI 2022-CIBCI)*
- *IEEE International Conference on Multimedia & Expo (ICME 2022)*
- *IEEE Symposium on Computational Intelligence for Brain Computer Interfaces (SSCI 2021-CIBCI)*
- *International Conference on Fuzzy Theory and Its Applications – Special Session for Computational Intelligence in Brain-Computer Interface, 2020*
- *UC San Diego Summer Research Conference, 2018*

Technical Committee

- *IEEE SMC Technical Committee on Brain-Machine Interface*

Program Committee

- *The 37th AAAI Conference on Artificial Intelligence, 2023*
- *IEEE International Conference on Fuzzy Systems, Luxembourg, July 11-14, 2021 (FUZZ-IEEE 2021)*
- *IEEE Symposium on Computational Intelligence for Brain-Computer Interfaces, Canberra, Australia, December 1-4, 2020 (SSCI 2020-CIBCI)*

- *The 36th Annual International Conference of Science Education, Dec 17-19, Kaohsiung, Taiwan (ASET 2020)*
- *IEEE International Conference on Fuzzy Systems, Glasgow, UK, July 19-24, 2020 (FUZZ-IEEE 2020)*
- *The 12th International Conference on Advanced Computational Intelligence, Dali, Yunnan, China, March 14-16, 2020 (ICACI 2020)*
- *The 18th annual IEEE International Conference on Bioinformatics and Bioengineering, Taichung, Taiwan, October 29-31, 2018 (IEEE BIBE 2018)*

Journal Reviewer

1. *ACM Computing Surveys*
2. *Biomedical Signal Processing and Control*
3. *Biosensors and Bioelectronics*
4. *Computers in Biology and Medicine*
5. *Entropy*
6. *Frontiers in Bioengineering and Biotechnology*
7. *Frontiers in Computational Neuroscience*
8. *Frontiers in Human Neuroscience*
9. *Frontiers in Neuroinformatics*
10. *Frontiers in Neuroscience*
11. *IEEE Computational Intelligence Magazine*
12. *IEEE Internet of Things Journal*
13. *IEEE Journal of Biomedical and Health Informatics*
14. *IEEE Transactions on Automation Science and Engineering*
15. *IEEE Transactions on Biomedical Circuits and Systems*
16. *IEEE Transactions on Biomedical Engineering*
17. *IEEE Transactions on Circuits and Systems*
18. *IEEE Transactions on Cognitive and Developmental Systems*
19. *IEEE Transactions on Cybernetics*
20. *IEEE Transactions on Emerging Topics in Computational Intelligence*
21. *IEEE Transactions on Fuzzy Systems*
22. *IEEE Transactions on Human-Machine Systems*
23. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*
24. *Information Sciences*
25. *International Journal of Electronics and Communications*
26. *Journal of Information Science and Engineering*
27. *Journal of Neural Engineering*
28. *Journal of Neuroscience Methods*
29. *Journal of Healthcare Engineering*
30. *Neural Computation*
31. *Neural Processing Letters*
32. *Sensors*

Conference Reviewer

- *AAAI 2023*
- *IEEE EMBC 2021*
- *FUZZ-IEEE 2019-2021*
- *ASET 2020*
- *IEEE SMC 2018*
- *ACM VRST 2018*

– *IEEE BIBE 2018*

Teaching

National Chiao Tung University, Taiwan
- **Brain-Computer Interface (in English)**, Spring 2021, 2022
- **Linear Algebra (in English)**, Fall 2021, 2022
- **Brain-Computer Interface**, Spring 2020
- **Machine Learning (in English)**, Spring 2020
- **Applications of Machine Learning in Education**, Fall 2019
- **Current Issues of Education**, Fall 2019
- **STS in Educational Research**, Fall 2019
- Teaching Assistant, **Signals and Systems**, Spring 2010

University of California San Diego, CA, USA
- Teaching Assistant, BENG 280A **Principles of Biomedical Imaging**, Fall 2014
- Teaching Assistant, BENG 122A **Biosystems and Control**, Winter 2013, 2015
- Teaching Assistant, BENG 103B **Bioengineering Mass Transfer**, Spring 2014

Mentoring

Graduate students

2022 –	Chia-Ying Hsieh, Computer Science, NYCU, Taiwan
2021 –	Yu-Cheng Chang, EEE, NYCU, Taiwan (co-ad. w/ Dr. Sin-Horng Chen)
2021 – 2023	Sung-Yu Chen, Computer Science, NYCU, Taiwan
2021 – 2023	Yue-Ting Pan, Computer Science, NYCU, Taiwan
2020 – 2023	Po-Ting Yeh, Computer Science, NCTU, Taiwan
2020 – 2023	Pin-Han Ho, Computer Science, NCTU, Taiwan
2020 – 2022	Xin-Yao Huang, Computer Science, NCTU, Taiwan
2020 – 2022	Wei-Chun Yang, Computer Science, NCTU, Taiwan
2020 – 2023	Ching-Hui Lo, Education, NCTU, Taiwan
2019 – 2022	Min Jiun Tsai, MMSC, NCTU, Taiwan (co-ad. w/ Dr. Ming-Cheng Shiue)
2018 – 2021	Poyuan Jeng, Visiting PhD student, UC San Diego, USA
2017 – 2020	Kuan-Jung Chiang, UC San Diego, USA
2016	Zhiya Liu, Visiting MS student, UC San Diego, USA
2009 – 2010	Yu-Shuen Tang, MS student, NCTU, Taiwan

Undergraduate students

2020 – 2022	Chia-Ying Hsieh, Computer Science, NCTU, Taiwan
2020 – 2021	Yu-Cheng Chang, Electrical and Computer Engineering, NCTU, Taiwan
2020 – 2021	Yu-Chih Wang, CS/Transportation and Logistics Management, NCTU, Taiwan
2019 – 2020	Hao-Cheng Yang, Computer Science, NCTU, Taiwan
2019 – 2020	Chi-Heng Gu, EECS, NTHU, Taiwan
2019 – 2020	Yi-Cheng Lu, Electrical Engineering, NTHU, Taiwan
2019 – 2020	Hsin-Yuan Chang, Electrical Engineering, NTHU, Taiwan
2019 – 2021	Ya-Lin Huang, Biology, NCTU, Taiwan
2019 – 2020	Kuan-Ting Lin, Biomedical Engineering, NTHU, Taiwan
2018 – 2019	Ting Yu, Mathematics, UC San Diego, USA
2018 – 2018	Xingyi Song, Visiting student, INC, UC San Diego, USA
2017 – 2018	Kritin Karkare, Bioengineering, UC San Diego, USA

Intern teachers

Administrative Services

Admission Committee

2022 –	Undergraduate Program, Computer Science, NYCU
2020 –	International Graduate Program, EECS, NCTU
2020 – 2021	Master Program, Computer Science, NCTU
2019 – 2021	Arete Honors Program, NCTU
2019 – 2020	PhD/Master Program, Institute of Education, NCTU

Administrative Committee

2022 –	Budget and Space, Computer Science, NYCU
2020 – 2022	Curriculum Committee, Computer Science, NCTU
2020 – 2022	International Student Affair Committee, Computer Science, NCTU
2019 – 2020	Library Committee, Institute of Education, NCTU
2017 –	Taiwanese Young Researcher Association (Tyra)

Publication

Journal Article

1. X.-Y. Huang, S.-Y. Chen, and **C.-S. Wei**, "Enhancing Low-Density EEG-Based Brain-Computer Interfaces with Similarity-Keeping Knowledge Distillation," *IEEE Transactions on Emerging Topics in Computational Intelligence*, Accepted.
2. J.-X. Huang, C.-Y. Hsieh, Y.-L. Huang, and **C.-S. Wei**, "Toward CNN-Based Motor-Imagery EEG Classification with Fuzzy Fusion," *International Journal of Fuzzy Systems*, 1-12, 2022. (SCI, 13/133, COMPUTATIONAL THEORY AND MATHEMATICS)
3. S.-R. Yang, T.-P. Jung, C.-T. Lin, K.-C. Huang, **C.-S. Wei**, H. Chiueh, Y.-L. Hsin, G.-T. Liou, and L.-C. Wang, "Recognizing Tonal and Non-Tonal Mandarin Sentences for EEG-based Brain-Computer Interface," *IEEE Transactions on Cognitive and Developmental Systems*, 2021. (SCI, 65/227, ARTIFICIAL INTELLIGENCE)
4. **C.-S. Wei**, C. Keller, J. Li, Y.-P. Lin, M. Nakanishi, J. Wagner, W. Wu, Y. Zhang, and T.-P. Jung, "Editorial: Inter-and Intra-subject Variability in Brain Imaging and Decoding," *Frontiers in Computational Neuroscience*, 15: 791129, 2021. (SCI, 27/67, MATHEMATICAL & COMPUTATIONAL BIOLOGY)
5. K.-J. Chiang, **C.-S. Wei**, M. Nakanishi, and T.-P. Jung, "Boosting Template-based SSVEP Decoding Method by Cross-domain Transfer Learning," *Journal of Neural Engineering*, 18(1), 016002, 2021.
6. P.-Y. Jeng, **C.-S. Wei**, T.-P. Jung, L.-C. Wang, "Low-Dimensional Subject Representation-based Transfer Learning in EEG Decoding", *IEEE Journal of Biomedical and Health Informatics*, 1-1, 2020. (SCI, 43/636, Engineering, Computer Science Applications)
7. M. Nakanishi, Y.-T. Wang, **C.-S. Wei**, K.-J. Chiang, and T.-P. Jung, "Facilitating Calibration in High-Speed BCI Spellers via Leveraging Cross-Device Shared Latent Responses," *IEEE Transactions on Biomedical Engineering*, 67, 1105-1113, 2020. (IF=4.491, Rank: 11/80, Top: 13.75% of ENGINEERING, BIOMEDICAL, SCI)
8. **C.-S. Wei**, Y.-P. Lin, Y.-T. Wang, C.-T. Lin, and T.-P. Jung, "A Subject-Transfer Framework for Obviating Inter- and Intra-Subject Variability in EEG-Based Drowsiness Detection," *NeuroImage*, 174, 407-419, 2018. (IF:5.426, Rank: 1/14, Top 7.14% of NEUROIMAGING, SCI)
9. **C.-S. Wei**, Y.-T. Wang, C.-T. Lin, and T.-P. Jung, "Toward Drowsiness Detection using Non-Hair-Bearing EEG-Based Brain-Computer Interfaces," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 26, 400-406, 2018. (IF=3.972, Rank: 3/65, Top: 4.61% of REHABILITATION, SCI)
10. Y.-T. Wang, M. Nakanishi, Y. Wang, **C.-S. Wei**, C.-K. Cheng, and T.-P. Jung, "An Online Brain-Computer Interface Based on SSVEPs Measured from Non-Hair-Bearing Areas," *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 25(1), 14-21, 2017. (Cover article) (IF=3.972, Rank: 3/65, Top: 4.61% of REHABILITATION, SCI)
11. Y.-T. Wang, K.-C. Huang, **C.-S. Wei**, T.-Y. Huang, L.-W. Ko, C.-T. Lin, C.-K. Cheng, and T.-P.

Jung, "Developing an EEG-Based On-Line Closed-Loop Lapse Detection and Mitigation System," *Frontiers in Neuroscience*, 8, 2014. (IF=3.877, Rank: 77/261, Top: 29.50% of NEUROSCIENCE, SCI)

12. Y.-P. Lin, Y. Wang, **C.-S. Wei**, and T.-P. Jung, "Assessing the Quality of Steady-State Visual-Evoked Potentials for Moving Humans using a Mobile Electroencephalogram Headset," *Frontiers in Human Neuroscience,* 8, 2014. (IF=2.871, Rank: 21/78, Top: 26.92% of PSYCHOLOGY, SCI)

Peer-reviewed Conference Paper (*Co-first author)

1. Y.-C. Chang, P.-H. Chao, Y.-M. Kuan, C.-J. Huang,L.-F. Chen, W.-C. Mao, T.-P. Su, S.-H. Chen, and **C.-S. Wei**, "Delay Analysis in Closed-Loop EEG Phase-Triggered Transcranial Magnetic Stimulation. *the 45th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Sydney, Australia*, 2023. (in press)

2. Y.-T. Pan, J.-L. Chou, and **C.-S. Wei**, "MAtt: A Manifold Attention Network for EEG Decoding," *Advances in Neural Information Processing Systems 35* (*NeurIPS '22*), New Orleans, LA , USA, 2022. (Acceptance rate: 25.6%)

3. Y.-C. Chang, P.-H. Chao, S.-H. Chen, and **C.-S. Wei**, "Toward EEG-Based Brain State Recognition for Personalized Neuromodulation," *the 15th IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC)*, Orlando, FL, USA, 2022

4. **C.-S. Wei**, "Normalized Canonical Correlation Analysis for Calibrating the Background EEG Activity in SSVEP Detection," *IEEE Symposium Series on Computational Intelligence (SSCI)*, Orlando, USA, 2021

5. **C.-S. Wei**, T. Koike-Akino, and Y. Wang, "Spatial Component-Wise Convolutional Network (SCCNet) for Motor-Imagery EEG Classification," *the 8th International IEEE/EMBS Conference on Neural Engineering (NER '19), San Francisco, USA*, 2019

6. T. Yu*, **C.-S. Wei***, K.-J. Chiang, M. Nakanishi, and T.-P. Jung, "EEG-Based User Authentication Using a Convolutional Neural Network," *the 8th International IEEE/EMBS Conference on Neural Engineering (NER '19), San Francisco, USA*, 2019

7. K.-J. Chiang, **C.-S. Wei**, M. Nakanishi, and T.-P. Jung, "Cross-Subject Transfer Learning Improves the Practicality of Real-World Applications of Brain-Computer Interfaces," *the 8th International IEEE/EMBS Conference on Neural Engineering (NER '19), San Francisco, USA*, 2019

8. **C.-S. Wei**, M. Nakanishi, K.-J. Chiang, and T.-P. Jung, "Exploring Human Variability in Steady-State Visual Evoked Potentials-Based Brain-Computer Interfaces", *IEEE International Conference on System, Man, and Cybernetics (SMC'18), Miyasaki, Japan*, 2018.

9. **C.-S. Wei**, Y.-P. Lin, Y.-T. Wang, C.-T. Lin, and T.-P. Jung, "Transfer Learning with Large-Scale Data in Brain-Computer Interfaces," *the 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'16), Orlando, USA*, 2016.

10. **C.-S. Wei**, Y.-P. Lin, N. Bigdely-Shamlo, Y.-T. Wang, C.-T. Lin, and T.-P. Jung, "Selective Transfer Learning for EEG-Based Drowsiness Detection," *IEEE International Conference on System, Man, and Cybernetics (SMC'15), Hong Kong, China*, 2015.

11. J. Song, **C.-S. Wei**, T.-P. Jung, and Y. Wang, "Monitoring and analysis of multiplicative characteristic variations for adhesive electrode by using self-electrocardiogram signals." *IEEE International Conference on System, Man, and Cybernetics (SMC'15), Hong Kong, China*, 2015.

12. **C.-S. Wei**, Y.-T. Wang, C.-T. Lin, and T.-P. Jung, "Toward Non-Hair-Bearing Brain-Computer Interfaces for Neurocognitive Lapse Detection," *the 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'15), Milano, Italy*, 2015.

13. **C.-S. Wei**, Y.-P. Lin, Y. Wang, Y.-T. Wang, and T.-P. Jung, "Detection of Steady-State Visual-Evoked Potential Using Differential Canonical Correlation Analysis," *the 6th International IEEE/EMBS Conference on Neural Engineering (NER '13), San Diego, USA*, 2013

14. **C.-S. Wei**, L.-W. Ko, S.-W. Chuang, T.-P. Jung, and C.-T. Lin, "Genetic Feature Selection in EEG-Based Motion Sickness Estimation," *2011 International Joint Conference on Neural Networks (IJCNN '11), San Jose, California, USA*, 2011.

15. **C.-S. Wei**, L.-W. Ko, S.-W. Chuang, T.-P. Jung, and C.-T. Lin, "Motion Sickness Estimation using an EEG-based Evaluation System," *the 5th International IEEE EMBS Conference on Neural Engineering (NER '11), Cancun, Mexico*, 2011.

16. **C.-S. Wei**, S.-W. Chuang, W.-R. Wang, L.-W. Ko, T.-P. Jung, and C.-T. Lin, "Implementation of a Motion Sickness Evaluation System Based on EEG Spectrum Analysis," *the IEEE International Symposium on Circuits and Systems (ISCAS '11), Rio de Janeiro, Brazil*, 2011.

17. **C.-S. Wei**, C.-H. Tsai, S.-M. Chiou, Y.-T. Hseu, T.-W. Liu, H.-Y. Lai, T.-F. Chien, Y.-H. Kuo, W.-T. Zhao, Y.-S. Tang, S. Y. Su, and Y.-Y. Chen, "Nonlinear Analysis of Movement-related Changes in Human Subthalamic Local Field Potentials," *the 32th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC'10), Buenos Aires, Argentina*, 2010.

Book Chapter

1. **C.-S. Wei** and T.-P. Jung, "Towards Real-World Neuromonitoring and Applications in Cognitive Engineering," *Springer Handbook of Neuroengineering* (pp. 1-18). Spinger Singapore, 2021.

2. **C.-S. Wei**, Y.-P. Lin, Y. Wang, and T.-P. Jung, "Exploring the EEG Correlates of Neurocognitive

Lapse with Robust Principal Component Analysis," *Human-Computer Interaction. Towards Intelligent and Implicit Interaction* (pp. 448-453). Springer Berlin Heidelberg, 2016.

3. Y.-P. Lin, Y. Wang, **C.-S. Wei**, and T.-P. Jung, "A mobile brain-computer interface for freely moving humans," *Human-Computer Interaction. Towards Intelligent and Implicit Interaction* (pp. 448-453). Springer Berlin Heidelberg, 2013.

4. L.-W. Ko, **C.-S. Wei**, T.-P. Jung, and C.-T. Lin, "Estimating the Level of Motion Sickness Based on EEG Spectra," *Foundations of Augmented Cognition. Directing the Future of Adaptive Systems* (pp. 169-176). Springer Berlin Heidelberg, 2011.