**CURRICULUM VITAE**

**Gansheng Tan, Ph.D. Candidate**

# Date

# May 18, 2024

# Address

Washington University School of Medicine

Department of Neurological Surgery

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# Education

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| 09/2022 – present | **Ph.D.** | **Biomedical Engineering** |
|  | Washington University in St. Louis, Missouri, USA | |
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| 09/2019 – 03/2022 | **M.Eng.** | **Mechanical Engineering** |
|  | Shanghai Jiao Tong University, Shanghai, China | |
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| 09/2015 – 09/2019 | **Diplôme d'ingénieur (postgraduate degree in engineering) & B.Eng.** | |
|  | CentraleSupélec, Île-de-France, France  Shanghai Jiao Tong University, Shanghai, China | |

# Research Interest

My research is driven by a profound interest in dissecting the complex neural circuits that underpin human cognition and behavior, with a focus on their electrophysiological mechanisms. Employing an interdisciplinary strategy synthesizing principles from neuroscience, engineering, and computational modeling, I seek to translate this knowledge into tangible neurotechnological innovations. Central to my mission is a comprehensive research agenda that spans the spectrum from foundational neuroscience to developing neurotechnological applications and their validation in clinical settings.

# Research and Professional Appointments

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| 09/2022 – present | **Graduate Research Assistant**  *Department of Neurosurgery, Washington University School of Medicine, St. Louis, MO, USA* |
| 09/2021 – 09/2022 | **Research Scholar**  *Department of Neurosurgery, Washington University School of Medicine, St. Louis, MO, USA*  Studied the neurophysiological effects of transcutaneous auricular vagus nerve stimulation |
| 11/2019 – 03/2022 | **Graduate Research Assistant**  *Department of Rehabilitation Medicine (Ruijin Hospital) - State Key Laboratory of Mechanical Systems and Vibration, Shanghai Jiao Tong University, Shanghai, China* |
| 05/2019 – 09/2019 | **Research Fellow**  *Lyon Neuroscience Research Center, French National Institute of Health and Medical Research, Bron, France* |
| 01/2018 – 03/2021 | **Graduate Research assistant**  *Signals and Systems Laboratory, French National Centre for Scientific Research,* Île-de-France, France |
| 10/2015 – 05/2017 | **Undergraduate Research assistant**  *State Key Laboratory of Mechanical Systems, Shanghai Jiao Tong University, Shanghai, China* |

# Skills

Software Engineering (Python, R, MATLAB, Github, Java, C/C++, HTML, CSS, 10 years)

Statistical Learning and Biomedical Data Analysis (7 years)

Clinical and Translational Research (4 years)

Scientific Writing and Illustration (Adobe Illustrator, MS Office, Latex, 5 years)

# Awards

2021 2021 China National Scholarship (top 0.5%)

2020 Changjiang Siyuan Scholarship, Shanghai Jiao Tong University, China

2018 Top 10 in Huawei Big Data Challenge in France

2018 Innovative Project Award, CS² Congrès Scientifique du Campus de Saclay, France

2017 Écoles Centrales Group – Chinese Universities Double Degree Scholarship, China

2016 Honor Student, Shanghai Jiao Tong University, China

2015 Excellent Design, Engineering Design Showcase, Shanghai Jiao Tong University, China

**Experience**

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| 11/2023 | **Poster Presentation: Improving working memory through vibrotactile auricular vagus nerve stimulation**  *Society for Neuroscience 2023, Washington, D.C., US* |
| 09/2023 | **Oral Presentation: Improving working memory with vibrotactile transcutaneous vagus nerve stimulation**  *BME Retreat 2023, St. Louis, MO, US* |
| 11/2022 | **Poster Presentation: The Coupling between Brain Oscillation and Muscle Synergies in Patients with Hemiparesis**  *Society for Neuroscience 2022, San Diego, CA, US* |
| 06/2022 | **Invited Seminar: The interaction between cortical oscillation and muscle synergies.**  *School of Computer Science and Engineering, Nanyang Technological University, Singapore* |
| 04/2022 | **Poster presentation: Towards individualized Transcranial Magnetic Stimulation for motor recovery from hemiparesis: study of Corticomuscular Network**  *2022 American Society of Neurorehabilitation (ASNR) Annual Meeting,**St.Louis, MO, US* |
| 09/2021 – 09/2022 | **Teaching Fellow (Instructor for Convergence, Integration, Probability, and Partial Differential Equation)**  *Laboratory in Mathematics and Computer Science (MICS), CentraleSupélec, Île-de-France, France* |
| 08/2018 – 05/2019 | **Vice President of International Student Union**  *CentraleSupélec, Île-de-France, France* |
| 04/2018 - 05/2018 | **Exchange Student**  *Department of Engineering, University of Cambridge, Cambridge, U.K* |
| 10/2017 – 06/2018 | **Project Manager**  *Tech for Good Explorer & La Condamine, Île-de-France, France* |

**Professional Societies**

Graduate Student Member of IEEE

Reviewer of IEEE International Conference on Systems, Man, and Cybernetics

Graduate Student Member of American Society of Neurorehabilitation

Graduate Student Member of Society of Neuroscience

# Peer Reviewed Publications

**Tan, G.**, Adams, J., Donovan, K., Demarest, P., Willie, J. T., Brunner, P., Gorlewicz, J. L., Leuthardt, E. C. (2024). Does vibrotactile stimulation of the auricular vagus nerve enhance working memory? A behavioral and physiological investigation. **Brain Stimulation**, 17(2), 460-468.

Liu, J., Wang, J., **Tan, G.**, Sheng, Y., Feng, L., Tang, T., Li, X., Xie, Q., Liu, H., Wei, Y. A Generalized Cortico-Muscular-Cortical Network to Evaluate the Effects of Three-Week Brain Stimulation. **IEEE Transactions on Biomedical Engineering** vol. 71 195–206 (2024).

Huguenard, A., **Tan, G.**, Johnson G., Adamek M., Coxon A., Zipfel G., Vellimana A., Brunner P., Leuthardt E. Non-invasive auricular vagus nerve stimulation following spontaneous subarachnoid hemorrhage reduces rates of radiographic vasospasm and hospital-acquired infections. **Journal of NeuroInterventional Surgery** (2023)

**Tan, G.**, Wang, S., Vierge, V., Mu, W., Wang, M., Greco, L., ... & Chaillet, A. (2022, October). An EEG Classifier to Discriminate Between Focused Attention Meditation and Problem-solving. **IEEE International Conference on Systems, Man, and Cybernetics** (SMC) (pp. 1954-1960).

**Tan, G.** et al. A framework for quantifying the effects of transcranial magnetic stimulation on motor recovery from hemiparesis: Corticomuscular Network. **Journal of Neural Engineering** (2022).

**Tan, G.**, Wang, J., Liu, J., Sheng, Y., Xie, Q., Brunner, P., Liu, H. Towards the Optimization of Repetitive Transcranial Magnetic Stimulation for Motor Recovery from Hemiparesis: Study of Corticomuscular Network. **2022 American Society of Neurorehabilitation Annual Meeting**.

**Tan, G.**, Xu, K., Liu, J. & Liu, H. A Trend on Autism Spectrum Disorder Research: Eye Tracking-EEG Correlative Analytics. **IEEE Transactions on Cognitive and Developmental Systems** 1–1 (2021).

Liu, J., **Tan, G.**, Wang, J., Wei, Y., Sheng, Y., Chang, H., Xie, Q., & Liu, H. Closed-loop construction and analysis of cortico-muscular-cortical functional network after stroke. **IEEE Transactions on Medical Imaging** 1–1 (2022).

Sheng, Y., **Tan, G.**, Liu, J., Chang, H., Wang, J., Xie, Q., & Liu, H. Upper Limb Motor Function Quantification in Post-Stroke Rehabilitation using Muscle Synergy Space Model. **IEEE Transactions on Biomedical Engineering** 1-1 (2022).

Liu, J., **Tan, G.**, Sheng, Y., Wei, Y. & Liu, H. A Novel Delay Estimation Method for Improving Corticomuscular Coherence in Continuous Synchronization Events. **IEEE Transactions on Biomedical Engineering** vol. 69 1328–1339 (2022).

Liu, J., **Tan, G.**, Sheng, Y. & Liu, H. Multiscale Transfer Spectral Entropy for Quantifying Corticomuscular Interaction. **IEEE Journal of Biomedical and Health Informatics** vol. 25 2281–2292 (2021).

Liu, J., Wang, J., **Tan, G.**, Sheng, Y., Chang, H., Xie, Q., & Liu, H. (2021). Correlation Evaluation of Functional Corticomuscular Coupling With Abnormal Muscle Synergy After Stroke. **IEEE Transactions on Biomedical Engineering** vol. 68 3261–3272 (2021).

Liu, J., **Tan, G.**, Sheng, Y., Wang, J., Lu, W., & Liu, H. Delay estimation for cortical-muscular interaction via the rate of voxels change. 2020 IEEE International Conference on Systems, Man, and Cybernetics (SMC) (2020)