**Gansheng Tan, Ph.D. Student**

Washington University School of Medicine,

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# Research Interest

I am a **self-motivated** and **team-minded Ph.D.** student with **6 years** of experience in **neuromodulation** research and bioelectrical signal processing. I seek to understand neural plasticity through electrophysiology, interact with these signals using an interdisciplinary approach, and develop new effective treatments for nervous system-related diseases.

# Education

09/2022 – present **Ph.D. Biomedical Engineering**

MO, USA. *Washington University in St. Louis*

09/2019 – 03/2022 **M.Eng. Mechanical Engineering**

Shanghai, China *Shanghai Jiao Tong University*

06/2017 – 09/2019 **Diplôme d'ingénieur (postgraduate degree in engineering)**

Île-de-France, *CentraleSupélec*

France Topics: Advanced Statistics, Machine Learning, Signal Processing

09/2015 – 06/2019 **B.Eng.**

Shanghai, China *Shanghai Jiao Tong University*

# Research and Professional Appointments

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| 09/2022 - present  St. Louis, MO, USA | **Graduate Research Assistant**  *Division of Neurotechnology, Department of Neurosurgery, Washington University School of Medicine in St. Louis*  Studying the impact of vibrotactile auricular vagus nerve stimulation on working memory and its mechanistic pathway |
| 09/2021 – 09/2022  St. Louis, MO, USA | **Research Scholar**  *Department of Neurosurgery, Washington University School of Medicine*  Studying the neurophysiological effects of transcutaneous auricular vagus nerve stimulation; investigating the interaction between cortical oscillation and muscle synergies |
| 11/2019 – 03/2022  Shanghai, China | **Graduate Research Assistant**  *Department of Rehabilitation Medicine (Ruijin Hospital) - State Key Laboratory of Mechanical Systems and Vibration, Shanghai Jiao Tong University*  Developed a framework based on Electroencephalography and Electromyography for individualizing Transcranial Magnetic Stimulation to promote recovery from stroke |
| 05/2019 – 09/2019  Bron, France | **Research Fellow**  *Lyon Neuroscience Research Center, French National Institute of Health and Medical Research*  Analyzed the cerebral oscillations underlying the meditative practices; developed a semi-automatic EEG signal preprocessing pipeline for meditation research |
| 01/2018 – 03/2021  Île-de-France,  France | **Graduate Research Assistant**  *Signals and Systems Laboratory, French National Centre for Scientific Research* Identified neural correlates of Focused Attention meditation and problem-solving state; developed a platform guiding meditators based on mental state classification |
| 10/2015 – 05/2017  Shanghai, China | **Undergraduate Research Assistant**  *State Key Laboratory of Mechanical Systems, Shanghai Jiao Tong University* |

# Skills

Software Engineering (Python, R, MATLAB, Github, Java, C/C++, HTML, CSS, 8 years)

Statistical Learning and Biomedical Data Analysis (5 years)

Clinical and Translational Research (3 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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| 06/2022  Singapore  10/2018 – 05/2019  Île-de-France, France  08/2018 – 05/2019  Île-de-France,  France  04/2018 - 05/2018 Cambridge, U.K.  10/2017 – 06/2018  Paris, France | **Invited Seminar**  *School of Computer Science and Engineering, Nanyang Technological University*  *The interaction between cortical oscillation and muscle synergies*  **Teaching Fellow**  *Laboratory in Mathematics and Computer Science (MICS), CentraleSupélec*  Instructor for Convergence, Integration, Probability, and Partial Differential Equation  **Vice President of International Student Union**  *CentraleSupélec*    **Exchange Student**  *Department of Engineering, University of Cambridge*  **Project Manager**  *Tech for Good Explorer & La Condamine* |

**Professional societies**

Graduate Student Member of IEEE

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

Reviewer of Biomedical Sciences

Graduate Student Member of American Society of Neurorehabilitation

Student Member of Society of Neuroscience

# Journal publications and conference proceedings

**Tan, G.**, Sheng, Y., Liu, J., Wang, J., Xie, Q., Liu, H., Brunner, P. The Coupling between Brain Oscillation and Muscle Synergies in Patients with Hemiparesis **Neuroscience 2022**.

**Tan, G.**, Wang, J., Liu, J., Sheng, Y., Xie, Q., Brunner, P., Liu, H. Towards individualized Transcranial Magnetic Stimulation for motor recovery from hemiparesis: study of Corticomuscular Network. ASNR meeting Abstract. Neurorehabilitation and Neural Repair. **Neurorehabilitation and Neural Repair** vol. 36 NP1–NP38 (2022).

**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 S., Vierge V., Mu W., Wang M., Greco L., Mounier H., Chaillet A. An EEG classifier to discriminate between focused attention meditation and a problem-solving task. **2022** **IEEE International Conference on System, Man, and Cybernetics** (2022).

**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)