

QU NIANCHONG | 屈念冲



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PhD Student in Design (Engineering) | Human Computer Interaction

Research interests:
Textile Sensors for Motion Capture | Human Body Reconstruction | Smart Rehabilitation Systems

EDUCATION

Tongji University Sep. 2024 - Jun. 2027

- PhD student in Design and Engineering, College of Design and Innovation Supervisor: Associate Professor Qi Wang
- Textile Sensor Networks for Human Motion Reconstruction
Developing modular textile sensors for precise motion capture and real-time biomechanical analysis.
 - Sports Health Monitoring & Management
Providing high-resolution data for performance tracking, injury prevention, and wearable health management.

Academy of Aerospace Liquid Propulsion Technology Sep. 2020 - Jul. 2023

- Master in Fluid Mechanics and Engineering for Liquid Rocket Engine
- Master's Thesis: Study on Cavitation Suppression of Variable Pitch Inducer in Liquid Rocket Engines.
 - Core Module: FEM and Application of CAE software, Computational Method, Innovative Design and Additive Manufacturing, Advanced Fluid Mechanics.

Jilin University Sep. 2016 - Jul. 2020

- Bachelor in Industry Engineering, School of Mechanical and Aerospace Engineering (SMAE)
- Final Year Project: Ergonomic-Based Design and Research of Bathroom Faucet Styles.

PUBLICATIONS

- Nianchong Qu, Jiaqi Mo, Yueyao Zhang, Yan Zhang (2024). Laytex: A Data-Driven Tool for Automated and Customized Textile Sensor Layout Design in Motion Capture. **Submitted to ACM IMWUT, under review.**
- Yueyao Zhang, Nianchong Qu, Runhua Zhang, Ye Tao, Guanyun Wang, Qi Wang (2023). **LayTex: A Design Tool for Generating Customized Textile Sensor Layouts in Wearable Computing.** In Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing & the 2023 ACM International Symposium on Wearable Computing (UbiComp/ISWC '23 Adjunct). 63–67. Cancun, Quintana Roo Mexico: ACM, 2023. <https://doi.org/10.1145/3594739.3610692>.
- Nianchong Qu, Kaifu Xu, Le Xiang, Ronghao Lin. A self-adaptive cavitation model based on Omega vortex identification theory[J]. Journal of Propulsion Technology, 2024, 45(2). doi: 10.13675/j.cnki.tjjs.2210076

RESEARCH EXPERIENCES

- Smart Textile Monitoring System for Post-Stroke Upper Limb Rehabilitation (Research Assistant) Jan. 2023 - Dec. 2025
 - Ideation: Contributed to the concept development of an **rehabilitation monitoring system based on textile sensors**.
 - Technology: Developed a system using **LSTM and attention mechanisms** to detect compensation movements during rehabilitation, enabling real-time monitoring and data-driven feedback.
- Textile-based Elderly Rehabilitation System (NSFC China-UK International Collaboration Project) Sep. 2024 - Mar. 2026
 - Ideation: As the **Primary Student Investigator**, proposed integrating textile sensors with emotional feedback to design a **community-based rehabilitation system for elderly cognitive and motor training**.
 - Design: Led project development to enhance elderly care through **wearable, data-driven rehabilitation**.
- Scoliosis Rehabilitation Monitoring System Development Sep. 2024 - Mar. 2025
 - Ideation: Proposed a muscle activation system for adolescent scoliosis rehabilitation with **EMG and textile sensors**.
 - Technology: Developing a **real-time feedback system** from collected data.
- Dual-task MCI Rehabilitation System with E-textiles and Mixed Reality Dec. 2023 - Jun. 2024
 - Ideation: Proposed integrating **e-textile sensors with Mixed Reality (XR) for MCI rehabilitation**.
 - Development: Led real-time motion tracking and **cognitive-motor training** in an immersive XR environment to enhance rehabilitation.

SKILLS

MATLAB (Proficient) / Python (Proficient) / Arduino (Proficient) / Motorcycle License (Proficient) / ANSYS / UG / Adobe / Figma