SHAOMING PAN

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EDUCATION

Shanghai Jiao Tong University **Shanghai, China**
Bachelor of Biomedical Engineering *Sep 2021 - Jun 2025*
Weighted Average Mark: 80.65/100

Relevant Course: Linear Algebra(85/100); Data Structure(90/100); Biomedical Image Processing(92/100); Biomedical Signals and Systems(89/100); Biomedical Engineering Course Design(95/100); Circuit Experiment(88/100)

PUBLICATIONS

- Jinyang Xu, Linfeng Li, Chenyi Jiang & **Shaoming Pan**. "Study on milling performances of 3Y-TZP ceramics using PCD and PCBN tools." *Materials and Manufacturing Processes*, vol. 38, no. 12, 2023, pp. 1495-1513. DOI: 10.1080/10426914.2022.2149792

ACADEMIC EXPERIENCE

Joint Landmark Detection and Groupwise Registration for Cardiac Motion Analysis
Undergraduate Thesis *Nov 2024 – Present*

- **Data Processing:** Developed a standardized pipeline to preprocess 242 cardiac MRI sequences—including ROI extraction, anonymization, and scale normalization—and performed fine-grained annotation of key anatomical landmarks.
- **Model Development:** Combined a 3D U-Net heatmap regression network with VoxelMorph-based groupwise registration, enhanced by local low-rank and smoothness constraints, to accurately capture dynamic myocardial deformation.
- **Comparative Evaluation:** Conducted experiments against Optical Flow and pairwise registration methods, assessing mean radial error (MRE), success detection rate (SDR), and strain curve visualizations to demonstrate superior synchronization and alignment.
- **Results:** Achieved an average radial error of 1.10 mm and a 92.37 % SDR (4 mm threshold); the model comprises 0.87 M parameters (3.49 MB), enabling rapid deployment and efficient iteration.

Intelligent MRI-based Diagnostic Research
Project Leader *Jul 2024 – Mar 2025*

- **System Development:** Employed U-Net for automatic segmentation and keypoint detection to identify critical landmarks.
- **Technical Innovations:** Built a 200+ case dataset with precise landmark annotations to enhance model training.
- **Outcomes:** Achieved 89.9% diagnostic accuracy, significantly reducing manual effort.

Semi-automatic Strain Analysis Using Cardiac MRI Sequences
Lead Researcher *Jan 2024 – Sep 2024*

- **System Development:** Combined semi-automated landmark annotation with iterative groupwise registration to align multi-frame image sequences and track key points.
- **Accuracy Enhancement:** Quantitatively evaluated functional metrics (e.g., annular plane excursions) to assess motion and deformation.
- **Workflow Impact:** Reduced manual labeling, streamlined analysis pipelines, and delivered objective, reproducible quantitative outputs.

Zirconia Ceramics Machinability Study
Lead Researcher *Jan 2022 – Dec 2022*

- **Purpose:** Investigated the machinability of dental zirconia ceramics to improve cutting efficiency and tool lifespan.
- **Technical Detail:** Optimized cutting speed and feed parameters to reduce tool wear and enhance precision.
- **Research Output:** Published in *Materials and Manufacturing Processes* (IF 4.783); cited by 7 papers to date.

EXTRACURRICULAR EXPERIENCES

RoboCup Team, Shanghai Jiao Tong University
Hardware Designer and Leader *Nov 2021 – Present*

- Designed and developed the **central electromagnetic system** for the vehicle baseplate, significantly improving performance and stability.
- Participated in both national and international RoboCup competitions, contributing to the team's technical strategies and innovations.
- Optimized the robot's center of gravity and introduced the innovative use of different wheel sizes, which **increased the ball rotation speed from 150 to 350 rpm**, significantly enhancing maneuverability during competitive events.

Medical Image Segmentation using Region Growing Method
Group Leader *Nov 2023 – Dec 2023*

- **Developed an algorithm** for prostate lesion segmentation in MRI/CT images.
- Led the presentation of findings, showcasing advancements in medical image segmentation.

MRI: Sequence Development and Image Reconstruction
Group member *Nov 2023 – Dec 2023*

- **Designed and tested MRI sequences**, acquiring hands-on experience with MRI operation in a lab setting.
- Applied **algorithmic reconstruction** to improve image quality for better diagnostic precision.

HONORS AND AWARDS

2024 RoboCup China, Second Prize (National level) *May 2024*
2023 RoboCup China, Second Prize (National level) *Jul 2023*
Outstanding Group Member, Shanghai Jiao Tong University *May 2023*
2022 RoboCup China, Second Prize (National level) *Nov 2022*
COVID-19 Prevention and Control Volunteer Certificate, Shanghai Jiao Tong University *May 2022*
RoboCup Internal University Competition, Champion *Oct 2021*

LANGUAGES AND SKILLS

- **Languages**: IELTS-Overall: 6.5 *(Listening: 7.5, Min: 6)*, CET-4, CET-6;
- **Skills**: Python, C++, MATLAB, LaTeX, SolidWorks, Microsoft Office Suite (Word, Excel, PowerPoint)