Ji Yu

Target Position: Image Algorithm Engineer

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Education

SDU (Shandong University, 985, 211) *Jinan, Shandong*

M.E. candidate in Control Science and Engineering *Sep. 2020 - Now*

- Researched on Medical Image Registration and Navigation of Puncture Surgery Robot
- Implemented related works using deep Learning methods

CUMT (China University of Mining and Technology, 211) *Xuzhou, Jiangsu*

B.E. in Electronic Information Engineering *Sep. 2016 - June. 2020*

- GPA: 4.06/5
- RANK: 24/254

Skills

Programming Python, C/C++, LaTeX, git; Experience in Python and Qt development

Deep Learning Pytorch, Tensorflow; Familiar with registration, generation and other CV algorithms

Languages English; Proficient in reading foreign papers and technical documents

Experience

National key R&D Development *Shandong University*

Development and validation of a minimally invasive robot system for particle implantation brachytherapy *Apr. 2020 - Now*

- Undertook the Research topic "Intraoperative Visual Guidance of Dynamic Multi-modality Fusion" as a key member of the project team.
- Developed several medical image deep learning-based registration algorithm applied for CT and multi-modality MR images.
- Implemented a navigation and execution robot system for surgical which performed image guided puncture operation.
- Actualized the project management such as system integration commissoning, project declaration cooperation and demand scheduling.

⌈ 1 ⌋ Research on medical image registration based on deep learning

Published 4 conference papers and applied for 1 patent.

Registration Methods for 4D CT of Lung Based on Temporal-Spatial Features.

- Developed a Temporal-Spatial Features fusion registration method to make up the absence of temporal characteristics in existing methods.
- Designed a novel temporal modeling module inserted into the bottleneck layer of UNet to process motion information .
- Proposed a Dual-stream registration Pipeline to fit the relationship between data and network.
- Achieved significant improvement results. Realated works published on BioCAS 2022 (in oral).

Multimodal Medical Image Registration based on Multi Metric Fusion

- Developed a multi metric registrion method combined intra-modality similarity and structure code metric to optimize network in a more global perspective.
- Extracted structure information from multimodal images by image dsentanglement as multimodal similarity metric.
- Designed fusion strategy for dual-metric registration model optimization with both intra-modality similarity and structure code.
- Outperformed on translation-based and single metric registration methods. Realated works published on ISBI 2022.

⌈ 2 ⌋ Development of surgical robot system with visual guidance

Development of Robot System, navigation, and related software

- Build the surgical navigation and execution system which takes NDI as the scene camera, UR5 as the executive mechanism, and Qt to design GUI.
- Standardized the navigation system functions, completed the calibration process of image, scene camera and robot.
- Realized TCP/IP communication with equipment for the exchange of tracking and guidance data
- Designed GUI for the functions of surgical navigation, dynamic display, and robot execution control.

⌈ 3 ⌋ Project process organization and management

Coordination among topics, project document writing and integration

- Wrote and integrated project declaration and sci-tech report.
- Coordinated with other units of the project to integrate the puncture robot system.
- Familiar with the planning, navigation, execution and clinical operation of the puncture surgery robot.

School Committees & Honors

School Committees

2016-2020 , Class Monitor/Student Union President/Student Assistant of University President *CUMT*

Honors

2020/2021 **Scholarship for Outstanding Students/Academic Scholarship**, less than 30% in SDU — *SDU*

2020 **Excellent graduates**, less than 5% in CUMT — *CUMT*

2019 **Excellent student cadres**, less than 1‰ in Jiangsu Province — *Jiangsu Education Department*

2018/2019 **Excellent student cadres**, less than 5% in CUMT — *CUMT*

Pub List

[1] **Y. Ji**, Z. Zhu and Y. Wei, "A One-Shot Lung 4D-CT Image Registration Method with Temporal-Spatial Features," 2022 IEEE Biomedical Circuits and Systems Conference (BioCAS), 2022 (Oral)

[2] **Y. Ji**, Z. Zhu and Y. Wei, "Fusion-Based Multimodal Medical Image Registration Combining Inter-Modality Metric and Disentanglement," 2022 IEEE 19th International Symposium on Biomedical Imaging (ISBI), 2022

[3] Y. Wei, **Y. Ji**, "Multimodal medical image registration method and system based on multi standard fusion,"202210095355.8(Substantive Examination)

[4] Z. Zhu, **Y. Ji** and Y. Wei, "Multi-Resolution Medical Image Registration with Dynamic Convolution," 2022 IEEE Biomedical Circuits and Systems Conference (BioCAS), 2022

[5] Z. Zhu, **Y. Ji** and Y. Wei, "Lung CT image registration based on end-to-end unsupervised learning," 2021 6th International Conference on Communication, Image and Signal Processing (CCISP), 2021