Ge Jin

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Education

University of Sydney 2016-2019
Bachelor of Information Technology *(Honours)*
First Class Honours, WAM: 85

University of Sydney 2020-Now
Doctor of Philosophy *(Engineering and IT)*
Thesis Title: Medical Volume Visualization Enhancement Using Deep Neural Networks
Supervisor: Prof. Jinman Kim
Thesis Submission: Late July, 2024

Research Interests

Direct Volume Rendering, Image Synthesis, Generative Adversarial Networks, Implicit Representations, Neural Radiance Fields, Mesh Deformation, Mesh Reconstruction, Contrastive Learning

Primary Research Projects

A GENERATIVE ADVERSARIAL NETWORK FOR UP-SAMPLING OF DIRECT VOLUME RENDERING IMAGES

- A conditional generative adversarial network that super-samples the ray-casting process to accelerate the DVR process with a novel loss function tailored for DVR images
- G. Jin, Y. Jung, M. Fulham, D. Feng, and J. Kim, “A Generative Adversarial Network for Upsampling of Direct Volume Rendering Images,” Computer Graphics Forum, accepted, 2024.

MISNER: MEDICAL IMPLICIT SHAPE NEURAL REPRESENTATION FOR 3D PELVIS VISUALIZATION

- A signed distance function based implicit shape representation network that reconstruct smooth and high quality pelvis from raw CT data
- G. Jin, Y. Jung, L. Bi, and J. Kim, “MISNeR: Medical Implicit Shape Neural Representation for Image Volume Visualisation,”, Computer Graphics Forum, accepted, 2024.
- Jin, Ge, Younhyun Jung, and Jinman Kim. "Challenges and Constraints in Deformation-Based Medical Mesh Representation." Computer Graphics International Conference. Cham: Springer Nature Switzerland, 2023. (As part of the study)

MISNER-X: MEDICAL IMPLICIT SHAPE NEURAL REPRESENTATION FROM X-RAY IMAGES by Contrastive-generative learning

- A signed distance function based implicit shape representation network that reconstruct smooth and high quality mesh from X-Ray utilising the paired CT during training with contrastive-generative learning
- G. Jin, Y. Jung, and J. Kim, “Medical Implicit Shape Neural Representation from a Single X-Ray,” in preparation to submit to Medical Image Analysis.

Other Research Projects

RibMR – A Mixed Reality Visualization System for Rib Fracture Localization in Surgical Stabilization of Rib Fractures: phantom, preclinical, and clinical studies

- Worked on segmenting the fractured rib structure and human skin, and reconstruct 3D mesh with manual annotations for mixed reality visualiztion
- Submitted to Journal of Digital Imaging
- Full author list: Hoijoon Jung; Jineel Raythatha; Alireza Moghadam; **Ge Jin**; Jaiwei Mao; Jeremy Hsu; Jinman Kim

Remote Interactive Surgery Platform (RISP): Proof of Concept for an Augmented-Reality-Based Platform for Surgical Telementoring

- As part of the MARSS 2022 Grand Challenge
- Kalbas, Yannik, Hoijoon Jung, John Ricklin, **Ge Jin**, Mingjian Li, Thomas Rauer, Shervin Dehghani et al. "Remote Interactive Surgery Platform (RISP): Proof of Concept for an Augmented-Reality-Based Platform for Surgical Telementoring." *Journal of Imaging* 9, no. 3 (2023): 56.

Engineering Projects

TELEPORTER - A USYD MILESTONE PROJECT 2017

- Developed a software for virtual reality recording with multi-cam stitching, stereo-cam triangulation and network broadcasting in Python & C++

HOLOLENS DVR - USYD SUMMER SCHOLARSHIP 2018

- Developed a real-time native direct volume rendering (DVR) tool on Microsoft HoloLens with C+ +/CX and shader programming (HLSL).

RPA SHIC VIEWER-P & 3SVR 2023-Now

- Contributed viewer functions for the USB PET/CT viewer (SHIC Viewer) for Royal Prince Alfred Hospital
- Implemented the python version of the SHIC Viewer software for better integration of modern deep learning algorithms
- Implemented the 3SVR to SHIC Viewer which gives an occlusion-free view of PET/CT fusion
- This led to an internship in Shanghai Jiaotong University to work with clinical experts for translational research

Other Experiences

PRESIDENT OF IEEE USYD STUDENT BRANCH 2022-Now

- The number of student members increased by 40% from previous year

Councillor of Sydney University Postgraduate Represenatative Asscoiation 2024-Now

Tutoring Experiences 2018-Now

- Courses include: INFO1110, INFO1103, SOFT2412, INFO5992

Skills

- **Language**: Native in Mandarin; Fluent in English (IELTS band 8)
- **Technical Skills**: Java, C, C++, HLSL, SQL, Python, OpenCV, PyTorch and adjacent packages