Jipeng Sun

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BACKGROUND KEYWORDS

Computer Generated Holography, Computational Neuroscience, Neuro-Robotics, 3D Computer Vision in AR, Embedded System, Computer Graphics, Knowledge Graph Mining, Computational Imaging, AI for Education & Public Health

EDUCATION

Northwestern University Evanston, US

Doctor of Philosophy in Computer Science *06/2022-06/2026*

- Barris Outstanding TA Award for CS351-1 Intro to Computer Graphics, CS351-2 Intermediate Level Computer Graphics
- Co-advised by Prof. Oliver Cossairt and Prof. Jack Tumblin

Master of Science in Computer Science, Thesis Track *01/2021-06/2022*

- Thesis: Simulation and Optimization Framework for Light Field Microscopy

Shandong University Jinan, China

Bachelor of Engineering with Honor, major in Software Engineering - GPA :88.72/100 *09/2015-06/2019*

- Thesis: SlidesKG: Building Domain Knowledge Graph from Lecture Slides
- Outstanding Graduate of Shandong Province

WORK EXPERIENCE

Computational Photography Lab, Northwestern University Evanston, US

Light Field Microscopy Optimization Research Assistant (NIH R34 Project) *03/2021-Current*

- Proposed and implemented framework for optimizing the optical forward model and volume reconstruction of LFM
- Developed differentiable approach to co-optimize the forward and backward process
- Developing GAN for zebrafish brain volume generation

Computer-Generated Holography Research Assistant (Sony Dynamic HoloDisplay Project) *03/2021-01/2022*

- Finished a review paper: Literature Survey for Computer Generated Holography, advised by Prof. Jack Tumblin
- Working on the Angular Multiplexing CGH Simulation project with Prof. Florian Willomitzer, PhD student Manuel Ballester
- Contribute to the Volume Hologram part of a Pytorch-based optics simulation lib: Tocohpy

Institute of Automation, Chinese Academy of Sciences Beijing, China

Neuro-Robotics Research Engineer *07/2019-03/2021*

- Full time worked in the Neuro-robotics Group (NRG), Research Center for Brain-inspired Intelligence, CASIA.
- Designed a SNN/ANN hybrid robotics bodily-self baby-learning model for NAO & iCub which can reproduce human rubber-hand illusion. Advised by Prof. Yi Zeng and Prof. Tielin Zhang.
- 3DSNN: A SNN structure considering neurons spatial information for modeling brain multisensory integration process.
- Assist Prof. Yi Zeng on 2021 UNESCO's *Recommendation on the Ethics of AI*

World Health Organization (WHO) Shanghai, China

Machine Learning Data Specialist *03/2020-08/2021*

- Proposed an ensemble learning model for Risk Prediction of Cardiovascular Events among Patients with Type 2 Diabetes.
- Developed the 2.0-2.2 version of WHO Data Explorer website using R Shiny Dashboard with Dr. Ningze Xu.

Sharing Tech Ltd. Jinan, China

Co-Founder & CEO *12/2016-08/2021*

- Lead Project YiZhi, developing NLP framework for paragraph understandability transformation.
- With more than 130 members in 5 years, lead Sharing Tech research on e-learning technologies including knowledge graph, learning recommendation and vertical-field QA system; launch online learning platforms with more than 300,000 visits; write more than 500,000 Chinese words CS course tutorials; and hold more than 100 offline learning events in Jinan City.

ACADEMIC PROJECTS

Angular Multiplexing Hologram Simulation *- CPL, NU 09/2021-01/2022*

- Cross-talk problem happened in the angular multiplexing hologram experiment for multiple reasons. Theoretically simulate the optics propagation process to find out the cause of the problem and use feed-back learning loop to correct the hologram.
- Contribute to a Pytorch-based optics simulation lib: Tocohpy on the volume hologram part.

Piano Glove Microprocessor System with AR/VR User Interface *- CE346 & CPL, NU 09/2021-012/2021*

- Designed a smart piano glove on Microbit with 5 flex sensors, 7 motor vibrators, and LED matrix to assist piano playing.
- Design an UI interface for hand gestures control in VR/AR application and use Bluetooth to communicate with glass devices.

Literature Survey in Computer Generated Holography *- CPL, NU 03/2021-09/2021*

- Review the point-based methods, polygon-based methods, layer based methods and ray-based methods used in CGH.
- Neural based methods are reviewed separately as the first review paper that cover that topic.

Could a Brain-inspired Robotics Bodily-self Model Generate Human Rubber Hand Illusion? *- NRG, CASIA 07/2019-03-2021*

- Study the neural circuits and mechanism of bodily self-consciousness of human beings, use SNN to model the biological process and verify the model on humanoid robots (iCub & NAO) by reproducing human rubber hand illusion (RHI).
- The project finally built world's first robotics system to generate rubber hand illusion through SNN.
- 3DSNN was proposed to solve the belief distribution problem for STDP based multisensory integration.