Haoyu Wei

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Education

- **Northwestern University** — Evanston, IL
  M.S. in Computer Science; GPA: 4.0/4.0 — *Sep. 2019 – Jun. 2021 (Expected)*
- **Sichuan University** — Chengdu, China
  B.Eng. in Software Engineering; GPA: 87.1/100 — *Sep. 2015 – Jun. 2019*
- **National University of Singapore** — Singapore
  Summer Workshop in School of Computing (in Cloud Computing & Big Data); Grade: A — *Jul. 2018 – Aug. 2018*

Research Experiences

- **Graduate Research Assistant** — Evanston, IL
  Northwestern Comp Photo Lab — *Oct. 2019 - Present*
  - Advised by Prof. Oliver Cossairt.
  - **Sparse-View CT Reconstructions.**
    • Reconstruction of Computed Tomography (CT) images with highly undersampled data ($\sim 1/8$ of data available).
    • Proposed a 2-step network archetecture, a variant of domain-specific perceptual network and several task-tailored sub-modules for reconstruction.
  - **Light Field Rendering of Holograms on 3D Glass Display.**
    • Developed an end-to-end light field display system, which generates a continous video of 30 frames from only 6 photos using a deep-learning-based lightfield rendering system. And displayed the rendered object on a 3D holographic display.
    • Tested the system on different textures and geometries, documented the system, and presented a demo on Ph.D. student visit day.
  - **Uncalibrated Deflectometry with Mobile Devices on Extended Specular Surfaces.**
    • To identify the origin of Kokomo glasses in churches and museums, we developed ways to examine the texture patterns of the glasses using a portable device.
    • Assisted in experiment setup and normal map feature extraction and matching of glasses.
- **Undergraduate Research Intern** — Chengdu, China
  SCU DICA Lab — *Mar. 2018 - Jun. 2019*
  - Advised by Prof. Jiancheng Lv.
  - **Lab Homepage Full Stack Development.**
    • Developed the lab website using Java Springboot. Functionalities include lab information display and a management system for internal use.
  - **A Comparative Study of Pheumonia Classification Algorithms based on CNN.**
    • Advised by Hao Yin.
    • Developed and compared 5 machine learning models for both binary and multi-class classifications of Chest X-Ray images. Models include a 11-layer CNN model and 4 transfer-learning CNN models paired with different classifiers. The result of the best performing model achieved over 95% accuracy, comparable with state-of-the-art.
- **Undergraduate Research Intern** — Shenzhen, China
  Harbin Institute of Technology Shenzhen Graduate School — *Jan. 2018 - Mar. 2018*
  - Advised by Prof. Chunkai Zhang.
  - Assisted in the research of over-sampling algorithm for imbalanced classification, which aims to solve the imbalanced classification problem by using variational auto-encoder to fit the probability function of the minority samples without prior assumption, and reasonably expand the minority set. Responsible for data processing and cleaning.

Publications

Haoyu Wei*, Florian Schiffers*, Tobias Würfl, Daming Shen, Daniel Kim, Aggelos Katsaggelos, Oliver Cossairt. "2-Step Sparse-View CT Reconstruction with a Domain-Specific Perceptual Network." (Under Review).

Selected Projects

- **Leader in project "Probe Data Analysis for Road Slopes"** *Apr. 2020*
  - Matching 3 million GPS points collected from different routes of driving to 0.2 million road links. Then calculate road slopes using matched data.
  - Applied hidden Markov model in map matching. By adapting Viterbi algorithm and some tricks, the processing time is improved by thousands of times compared to brute force.
- **Personal project "Ray Tracing and Physically-based Graphics Modeling"** *Jan. 2020 - Mar. 2020*
  - Two 3D WebGL-based computer graphics projects written from scratch without advanced frameworks: 1. Physically based animation and modeling. Simulated tornatos, boid flocking behavior, spring mass system, and different ODE solvers; 2. Ray Tracing and Ray Marching. Reflection and shadow effects of 3D objects.
- **Leader in project "Android Mirror Painting Application"** *Mar. 2017 - Jun. 2017*
  - Developed an Android app where users can draw on either side of the phone screen while automatically generating symmetrical paintings on the other side in real time, with all painting tools supported.
  - Responsible for Android front-end development and database design.

Industrial Experiences

- **HUAWEI Technologies Co., Ltd** Chengdu, China
  Big Data Engineer Intern, 2012 Research Lab *Sep. 2018 - Dec. 2018*
  - **Data Analysis**: Performance analysis, optimization of Flow Tracing and Diagnosing System (FTDS) using Java, and statistical analysis of FTDS manager.
  - **Documentation**: FTDS user manual and development documents.
- **TOSIT Technologies Co., Ltd** Chengdu, China
  Big Data Engineer Intern *Mar. 2018 - Apr. 2018*
  - Research in Big Data pipelines in industries.
  - Led a team to develope a streaming data pipeline that integrates Hadoop, Spark Streaming, Flume, Kafka, Zookeeper and Hbase, and is able to handle large amount of real-time data flow.

Activities & Services

- **Department Leader** Chengdu, China
  Alibaba Club, Sichuan University *Oct. 2016 - Jun. 2019*
- **English Teacher Volunteer** Chiangmai, Thailand
  Ban Thabdua School *Aug. 2017*

Awards & Honors

- ***Outstanding Graduate*** *Jun. 2019*
- ***Nomination of Star Graduate of School of Software*** *May. 2019*
- ***Full Scholarship for NUS summer program*** *2018*
- ***National English Competition for College Students(NECCS) - Second Price*** *2017, 2018*
- ***The First Class Individual Scholarship*** *2017 - 2018*
- ***The Second Class Scholarship (Top 10%)*** *2016 - 2017*
- ***The Second Class Individual Scholarship*** *2015 - 2016*

Programming Skills

- **Languages**: *Python, Java, Javascript, C/C++, MATLAB*

Personal Links

- **GitHub:** https://github.com/whywww
  Personal Website: https://whywww.github.io/