Jinglun Feng

Robotics Ph.D. Candidate @ The City College Of New York

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Dedicated Ph.D. Candidate @ CCNY Robotics Lab focused on Robotics and Computer Vision. Skillful in 3D Scene Reconstruction, SLAM, Object Detection & 6D Pose Estimation, Image Segmentation, Novel View Synthesis, and Robotics Intelligent Inspection.

Technical Skills

Programming Language: C++, Python.

Platforms: Linux (Ubuntu), Robotic Operating System (ROS), OpenCV, Open3D, G2O, PyTorch, TensorFlow, MATLAB, Blender

Education

2018-09 - 2023-05

Ph.D.: Electrical Engineering, Robotics

The City College of New York - New York, NY
Research Topics: Robotic Intelligent Infrastructure Inspection, Indoor/Outdoor 3D Scene Reconstruction
GPA: 3.74/4.0

2015-09 - 2018-06

Master of Science: Control Engineering, Robotics and Intelligent Systems

Shandong University - China
Research Topics: Visual SLAM, Robots Obstacle Avoidance
GPA: 3.61/4.0

2011-09 - 2015-06

Bachelor of Science: Electrical Engineering & English

Shandong Jianzhu University - China

Professional Experience

2022-05 - 2022-12

Research Intern

***Samsung Research America (SRA)**, Mountain View, CA*

- Implementing 3D indoor scene reconstruction with explicit Octree-based NeRF model and

SLAM pipeline.

- Employ an explicit NeRF model with Octree structure to self-supervise tracking and mapping thread using learning approach rather than traditional visual odometry and graph optimization methods, thus we do not require trajectory ground truth to supervise network to estimate pose and mapping information.
- Deploy Intel OpenBot to automate RBG-D data collection from a mobile robotic platform in an indoor environment.
- Assisted with preparing project-related reports, presentations and manuscripts.

2020-01 - Current

NSF Project Tech-Leader

CCNY Robotics Lab, The City College Of New York, New York, NY

NSF SBIR Phase-II Project: Robotic Inspection and Data Analytics to Localize and Visualize the Structural Defects of Civil Infrastructure

- The goal of project is to develop a robotic inspection system using visual inspection system and ground penetration radar (GPR) to detect surface and subsurface defects of concrete infrastructures.
- Directed software design, feature definitions and production support. Assisted lab members in design, configuration or application of robotic systems.
- Collaborate & Develop Defects Visual Inspection Software with Unity, which contains 2D defect detection, 2D defect segmentation, 3D defects scene mapping, and 3D metric calculation features.
- Develop a visual SLAM system fused with IMU for robot localization and mapping, then time-synchronized the pose with other sensors, such as GPR, in ROS.
- Propose a learning-based method for underground object detection and 3D reconstruction method based on GPR data.
- Collaborate & Develop 3D GPR migration software, which uses a conventional back-projection method to process and reconstruct the underground targets.
- Create a synthetic GPR dataset that covers the majority of subsurface infrastructure scenarios containing items of varying sizes, depths, and shapes, such as cylindrical, spherical, and cubic.
- Contribute to the omni-directional robotic mobile platform design, building, and testing.
- Distinguished product issues and gathered information on customer experiences with team members.

2021-06 - 2022-05

Research Intern

ABB, Raleigh, NC

- Gathered, arranged and generate physically based renderer (PBR) data using BlenderProc to create robust and representative dataset for object 6D pose estimation network training.
- Improving performance of object 6D pose estimation using deep iterative matching

method.

- Benchmark SOTA learning-based methods of object detection and object pose estimation, improve object pose estimation accuracy using ICP.
- Assisted with preparing project-related reports, presentations and deliverer, maintain readable codes.

2019-05 - 2019-09

Research Intern

Geophysical Survey System Inc, Nashua, USA

- Collaborate with other engineers on design and deployment of GPR migration algorithm targeted for subsurface object reconstruction.
- Test and integrate computer vision solutions in GPR data collection and processing, such as multi-view geometry and visual optometry for GPR data localization and 2D feature detection and segmentation for GPR data processing.
- Setup robotic mobile platform for engineering team to automate GPR data collection, and tag visual positioning data with GPR data.

Selected Publications (Patents / Papers)

- **Jinglun Feng**, Yang, L., Hoxha, E., & Xiao, J. (2022). "Improving 3D Metric GPR Imaging Using Automated Data Collection and Learning-based Processing" *IEEE Sensors Journal*.
- Yang, Liang*, Bing Li*, **Jinglun Feng***, Guoyong Yang, Yong Chang, Biao Jiang, and Jizhong Xiao. "Automated wall-climbing robot for concrete construction inspection." *Journal of Field Robotics*. (***Equal Contribute**)
- **Jinglun Feng**, Yang, L., Hoxha, E., B., Jiang, & Xiao, J. (2022). Robotic Inspection of Underground Utilities for Construction Survey Using a Ground Penetrating Radar. Journal of Computing in Civil Engineering
- **Jinglun Feng**, L. Yang, Ejup Hoxha, Diar Sanakov, Stanislav Sotnikov and Jizhong Xiao. "*GPR-based Model Reconstruction System for Underground Utilities Using GPRNet*." In 2021 IEEE International Conference on Robotics and Automation (ICRA), 2021.
- **Jinglun Feng**, L. Yang, Haiyan Wang, Yingli Tian, Jizhong Xiao. "*Subsurface Pipes Detection Using DNN-based Back Projection on GPR Data*", Winter Conference on Applications of Computer Vision (WACV), 2021.
- **Jinglun Feng***, L. Yang*, Haiyan Wang, Yifeng Song, and Jizhong Xiao. "*GPR-based Subsurface Object Detection and Reconstruction Using Random Motion and DepthNet*." In 2020 IEEE International Conference on Robotics and Automation (ICRA), 2020.
- **Jinglun Feng**, Hua X, Hoxha E, et al. "*Automatic Impact-sounding Acoustic Inspection of Concrete Structure*". 10th international conference on structural health monitoring of intelligent infrastructures (SHMII-10), 2021.
- Haiyan Wang, L. Yang, Xuejian Rong, **Jinglun Feng**, Jizhong Xiao, Yingli Tian. "*Self-supervised 4D Spatio-temporal Feature Learning via Order Prediction of Sequential Point Cloud Clips*". Winter Conference on Applications of Computer Vision (WACV), 2021.

- U.S. Copyright Case #: 1-9890704641, The title of the software is *"GPR Migration C++"* for ground penetrating radar (GPR) migration and subsurface object detection and mapping, Inventors: **Jinglun Feng**, Jizhong Xiao, filing date: 11/18/2020, owned by InnovBot (100%).
- CUNY Docket Number TCO #21A0001 (GPR migration, NN-based) *"Subsurface Map Reconstruction Using GPR data and Neural Networks"*, inventors: Jizhong Xiao, **Jinglun Feng** and Liang Yang, Provisional paten application # 63064661, filing date: Aug. 12, 2020, ownership: InnovBot (50%) and CUNY (50%).
- CUNY Docket Number #: 20A0037. (GPR-imaging, Omni-GPR-Cart) *"Method and Apparatus for Automatic GPR Data Collection and GPR Imaging"*, Inventors: Jizhong Xiao, **Jinglun Feng** and Liang Yang, Provisional patent application #63031977, filing date: May 29, 2020, ownership: InnovBot (50%) and CUNY (50%).

Paper Review

- IEEE Robotics and Automation Letter
- Automation in Construction
- Journal of Visual Communication and Image Representation
- Journal of Imaging
- Applied Sciences
- Institute of Electronics, Information and Communication Engineers (IEICE)
- IEEE Conference on Winter Applications of Computer Vision (WACV since 2021)
- IEEE International Conference on Robotics and Automation (ICRA since 2020)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS since 2020)

Teaching Experience

- Adjunct Lecturer for course "EE425: Computer Engineering Lab" at Dept. of Electrical Engineering, City College, The City University of New York (Fall 2019 – Spring 2021)
- Teaching Assistant for course "G5501: Introduction to Robotics" at Dept. of Electrical Engineering, City College, The City University of New York (Fall 2020)
- Teaching Assistant for course "G3300: Advanced Mobile Robotics" at Dept. of Electrical Engineering, City College, The City University of New York (Spring 2021)