# Haoming Li

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## Education

**University of Pennsylvania**, Philadelphia, PA — May 2024 (Expected)
*Master of Science*, Electrical Engineering

**China University of Geosciences**, Beijing — June 2021
*Bachelor of Engineering*, Electrical and Information Engineering — *GPA: 89.74/100*

## Conference Publication

Y. Liu, H. Li, M. Huang, D. Chen, and B. Zhao, "Ice Crevasse Detection with Ground Penetrating Radar using Faster R-CNN," 2020 15th IEEE International Conference on Signal Processing (ICSP), 2020, pp. 596-599. Oral Presentation

## Research Experience

**Reactive Collision Avoidance using Neural Signed Distance Functions and Neural Radiance Fields**
*Research Assistant (Advisor: Dr. Nadia Figueroa)* — May. 2023 – Present
*University of Pennsylvania*
Implicitly represent the scene using parametric and positional encodings. Use two MLPs to decode the features as signed distance functions (SDFs) and their gradients in real-time.
Use the estimated SDFs and their gradients to construct a visual control barrier function to achieve reactive collision avoidance.
Apply our method to both simulation and the real robot (Fetch), and achieved real-time performance.

**Improving Robustness by Restricting Estimated Lipschitz Constants of Neural Networks**
*Research Assistant* — Dec. 2022 – Feb. 2023
*University of Pennsylvania*
Implement a weight normalization and a Lipschitz regularization on autoencoder and DeepSDF to encourage smooth latent spaces.
Restrict Lipschitz constants of MLPs to improve performance of adversarial robustness and 2D/3D shape interpolation.

**Hyperspectral Remote Sensing Images Change Detection Based on Visual Transformer**
*Research Assistant (Advisor: Dr. Keming Chen)* — Oct. 2020 – July. 2022
*Institute of Electronics, Chinese Academy of Sciences*
Propose a self-attention-based architecture to handle remote sensing image change detection (segmentation) tasks with accuracy above 98%.

**Enhancing Safety for Arctic Expedition Vehicles with Real-time Detection of Ice Crevasses**
*Research Assistant (Advisor: Dr. Yan Liu)* — Feb. 2019 – Sep. 2020
*University of Chinese Academy of Sciences*
Develope an ice crevasse detection method based on Faster R-CNN achieving an accuracy above 95%.
Process each ground penetrating radar data sample with 0.18 seconds, which reaches real-time performance for protecting Yeti robots from ice crevasse in polar exploration.

## Awards

Second Prize in the 1st Undergraduate Physics Academic Competition of Beijing.

First Prize in the 10th Innovation Creativity Entrepreneurship.

Third Prize in the 14th Undergraduate Physics Experiment Competition.

School of Information Engineering Award

## Skills

Python, C++, MATLAB, LaTeX.