Xubo Luo

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Research interests

Deep learning, computer vision, visual navigation, medical image processing

Education

2019 – Present **Shanghai University of Finance and Economics** – Shanghai, China
BA in Computer Science
Mentor: Tsz Chiu Kwok (*GPA: 3.47*).

Honors and scholarships

2021 The people's scholarship in China (Shanghai University of Finance and Economics)

Publications

2022 **Deep learning-based cross-view image matching for UAV geo-localization**
Xubo Luo, Yaolin Tian, Xue Wan*, Jingzhong Xu, Tao Ke.
ICoSR 2022.

2023 **BAST: Boundary-Aware Swin Transformer for infrared and visible image fusion**
Xubo Luo, Liping Wang*, Jinshuo Zhang, Dongmei Niu.
Information Sciences (Under review).

Research experience

September 2022 – Present

Deep learning-based UAV localization

Mentors: Xue Wan (Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences).

My primary responsibility in this project is to develop a deep learning-based localization system for unmanned aerial vehicles (UAVs). One of the major challenges we face is the domain difference between the images captured by UAVs and those captured by satellites, as well as the large size of these images. To address this challenge, we have proposed a novel approach that combines simultaneous localization and mapping (SLAM) with image matching. This method has shown promising results on our simulation dataset.

September 2021 – August 2022

Infrared and visible image fusion

Mentors: Caiming Zhang (Shandong University).

As a part of this image fusion project, my focus is on the fusion of infrared and visible images. We have developed an effective and versatile framework for infrared and visible image fusion. Notably, this framework has demonstrated excellent performance in tasks such as computed tomography (CT) and magnetic resonance imaging (MRI) image fusion.

July 2020 – June 2021

Medical image processing

Mentors: Xiuyang Zhao (University of Jinan).

My primary focus in this medical image processing project is on three key areas: CT image denoising, CT and MRI image fusion, and 3D reconstruction. Through our research, we have found that our denoising is highly effective in eliminating metal artifacts in CT images. In fact, our approach has been acknowledged by medical professionals at the Shandong Provincial Hospital, who have recognized its potential to significantly improve the accuracy and reliability of medical imaging techniques.

Talks and tutorials

December 2022

Deep learning-based cross-view image matching for UAV geo-localization

Oral presentation at ICoRS 2022. The proposed UAV localization method is introduced, and the localization of future planetary exploration vehicles combined with landers is discussed.

Technical skills

Programming languages

Proficient in: Python, Cpp, Matlab

Familiar with: R

Languages
English, Chinese

Other interests

In my spare time, I enjoy skiing, playing electric guitar, and cycling. As an energetic individual, I am constantly curious about the unknown and love to explore new things.