

# CHENGGUANG XU

815 Columbus Ave, Boston, MA 02120

☎ 617-407-6168    ✉ xu.cheng@northeastern.edu    Homepage    Google Scholar

## EDUCATION

- **Northeastern University** Boston, MA, USA  
*Ph.D. candidate in Computer Science*  
*Advisors: Prof. Lawson L.S. Wong, Prof. Christopher Amato*  
Sep 2018 - Dec 2024 (expected)
- **Nankai University** Tianjin, China  
*M.S. in Control Science and Engineering*  
*Advisors: Prof. Han Zhang, Prof. Feng Duan*  
Sep 2015 - July 2018
- **Nankai University** Tianjin, China  
*B.E. in Automation*  
*Advisor: Prof. Feng Duan*  
Sep 2010 - July 2014

## SCHOLARLY INTERESTS

Computer Vision, Deep Reinforcement Learning, Foundation Models (i.e., LLMs and VLMs), Cross-modality Learning (i.e., vision and language), Navigation System, Robotics.

## PUBLICATIONS

- Robot Navigation in Unseen Environments using Coarse Maps.  
**Chengguang Xu**, Lawson L.S. Wong, Christopher Amato. IEEE International Conference on Robotics and Automation (*ICRA*), May 2024.
- Vision and Language Navigation in the Real World via Online Visual Language Mapping.  
**Chengguang Xu**, Hieu T. Nguyen, Christopher Amato, Lawson L.S. Wong. In the Workshop of the Foundation Models for Decision Making Workshop @ (*NeurIPS*), Dec 2023.
- Learning to Navigate in Unseen Environments using 2-D Rough Maps.  
**Chengguang Xu**, Lawson L.S. Wong, Christopher Amato. In the Workshop of the 5th Multi-disciplinary Conference on Reinforcement Learning and Decision Making (*RLDM*), June 2022.
- Hierarchical Robot Navigation in Novel Environments using Rough 2-D Maps.  
**Chengguang Xu**, Christopher Amato, Lawson L.S. Wong. In the Proceedings of the Conference on Robot Learning (*CoRL*), November 2020.
- Deep Supervised Summarization: Algorithm and Application to Learning Instructions.  
**Chengguang Xu**, Ehsan Elhamifar. In the Proceedings of the Conference on Neural Information Processing Systems (*NeurIPS*), November 2019.
- Design and Performance Evaluation of a Simple Semi-Physical Human-Vehicle Collaborative Driving Simulation System.  
Wenyu Li, Feng Duan, **Chengguang Xu**. In the IEEE Access, March 2019.

## RESEARCH EXPERIENCE

- **Learning Cross-modality Instruction-and-Map Encoder Representation:** This *ongoing* project aims to learn a cross-modality encoder representation from transformers through pre-training. The goal is to ground complex human instructions in natural language to the metric-semantic feature maps of real-world scenes. (*Python, Pytorch, Hugging Face Transformers library, Habitat Matterport3D simulator, ROS*)
- **Visual Navigation in Unseen Houses using Coarse Maps:** Proposed a navigation framework utilizing 2-D hand-drawn maps for visual navigation in unseen houses. (*Python, Pytorch, Habitat Lab simulator*). Published at **ICRA-24**
- **Visual-and-language Navigation (VLN) in Real World:** Developed a zero-shot navigation framework for Vision-and-Language Navigation (VLN) in real-world scenarios using foundation models (LLMs and VLMs). Deployed on an Interbotix LoCoBot WX250. (*Python, Pytorch, ROS Noetic*). Published at Foundation Models for Decision Making Workshop @ **NeurIPS-23**
- **Hierarchical Visual Navigation using Deep Reinforcement Learning:** Introduced a hierarchical visual navigation framework, combining deep generative models (i.e., Variational Autoencoders) for high-level planning and image goal-conditioned DQN policy for low-level control. (*Python, Pytorch, Deep Mind Lab simulator*). Published at **CoRL-20**.
- **Deep Video Summarization:** Designed a triple loss to solve the supervised video summarization task based on the theory of facility location problem. (*Python, Pytorch*). Published at **NeurIPS-19**

## SKILLS

- **Programming languages:** Python, C++
- **Deep Learning Frameworks:** Pytorch, Hugging Face Transformers
- **Computer Systems:** Linux, Robot Operating System (ROS)