



中山大學  
SUN YAT-SEN UNIVERSITY

# Yongxue Xu

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## 🎓 Education

Sun Yat-sen University (SYSU) *Project 985 / 211 / Double First-Class* Sep. 2023 – Jun. 2027

B.Eng. in Intelligent Science and Technology, School of Intelligent Systems Engineering

GPA: 3.91 / 4.0 | Major GPA: 3.94 / 4.0 (*Major Required + Major Elective*)

Research Interests: Multimodal Large Language Models · Vision-Language Models · Video Understanding · 4D Scene Understanding

## 🔬 Research Experience

### Vision-Language Models and Benchmark for Multi-View 4D Scene Understanding

- **Overview:** Targeted object-level 4D understanding in multi-view temporal scenes. To address the lack of unified cross-view, cross-timestep annotations and current VLMs' inability to output object-level 3D trajectories, built a multi-view 4D understanding **benchmark** over three domains and proposed **LMM-Track4D**. Introduced a [TRK] streaming state token for online cross-time state tracking, and designed a three-module architecture — *geometric projection*, *state memory*, and *trajectory decoding* — supporting both textual QA and 3D trajectory output.
- **Responsibilities:** Contributed to benchmark data construction; led the overall technical roadmap and model architecture design; conducted the main experiments.
- **Outcome:** Manuscript submitted as **co-first author** to **NeurIPS 2026** (CCF-A).

### Robust Competitive Influence Maximization on Multi-Layer Graph Networks

- **Overview:** Focused on robust competitive influence maximization over multi-layer graphs. To tackle poor cross-layer information alignment, inaccurate influence modeling of key nodes, and unstable seed selection in complex scenarios, proposed an integrated framework combining *cross-layer alignment*, *role-based constraints*, and *multi-task evolutionary search*, achieving SOTA results on multiple datasets.
- **Responsibilities:** Defined the overall technical roadmap; designed core modules and training strategies; conducted the main experiments; led patent filing and journal manuscript drafting/submission.
- **Outcome:** **1 patent pending**; manuscript submitted as **first author** to **IEEE TNSE**.

### Object-Level World State Modeling for Long-Term Occluded Video Instance Segmentation

- **Overview:** Tackled identity drift, severe occlusion, and object disappearance–reappearance in long-video instance segmentation. Proposed **OVS-VIS**, which replaces latest-feature memory with a continuously evolving object-level world state via a three-module architecture — *gated implicit state evolution*, *canonical latent-space identity anchoring*, and a *lifecycle-aware state machine* — jointly supporting long-term identity preservation and short-term segmentation accuracy under occlusion.
- **Responsibilities:** Led the overall technical roadmap, model architecture, and training paradigm design; implemented core modules; conducted the main experiments; led manuscript drafting and submission.
- **Outcome:** Manuscript in preparation for **AAAI 2027** submission.

### Critical Node Identification in Urban Road Networks via Deep Reinforcement Learning

- **Overview:** Built a unified DRL evaluation framework integrating multiple SOTA models, using GNNs to represent road-network topology and DQN for adaptive critical-node decisions; validated across multi-scale real-world networks. Personally contributed dataset construction, baseline reproduction, and experimental visualization.
- **Outcome:** Co-authored paper received the **Best Paper Award** at **GBCESC 2025**.

## 🏆 Awards & Competitions

Chinese Mathematics Competition (CMC), Guangdong Region — Second Prize Dec. 2024

Mathematical Contest in Modeling (MCM), USA — Honorable Mention Feb. 2025

National Undergraduate Smart Car Competition, South China Region — Second Prize Aug. 2025

## 🔧 Skills & Interests

- **Programming:** Python, C/C++, MATLAB; experienced with PyTorch.
- **Languages:** CET-6 certified; IELTS preparation in progress (target Aug 2026).
- **Interests:** Table tennis, music, and nature travel.