

Tianyi Xiong

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EDUCATION

- **Tsinghua University, Beijing, China** Aug 2019 - Present
BA in Computer Science and Technology
 - GPA: 3.88 / 4.00 (top 20%); Minor in Statistics
 - GPA 4.00 / 4.00 in Relevant Coursework: Calculus, Linear Algebra, Discrete Math, Probability and Statistics, Fundamental of Programming, Principles of Signal Processing, OOP, JAVA, Computer Graphics, HCI, Machine Learning, 3D Visual Computing, ...
 - Research Interests: Machine Learning, Computer Vision, and Multi-modality

RESEARCH EXPERIENCE

- **Open-Vocabulary Image Segmentation** Jul 2022 - Nov 2022
Advisor: Prof. Zhuowen Tu *mlPC Lab, UC San Diego*
 - Unified semantic, instance, and panoptic segmentation in the open-vocabulary settings into a two-stage pipeline of a class-agnostic mask proposal network and a CLIP-based mask classifier
 - Proposed a score-based progressive training method for training robust mask proposal networks as well as an effective and efficient method of finetuning CLIP, which outperformed previous works on all open-vocabulary segmentation tasks by at least 25%
 - Co-first authored a paper to appear at **ICCV 2023**
- **Automatic Commercial Place Planning System** Apr 2022 - Jun 2022
Advisor: Prof. Songhai Zhang *Graphics & Geometric Computing Group, Tsinghua University*
 - Proposed an automatic system for generating design plans for commercial places in virtual environments based on a parameterization of traffic flow patterns
 - Designed a set of traffic flow patterns and constraints; implemented an iterative optimization algorithm based on simulated annealing; undertook two user studies to prove its effectiveness
 - Submitted to **ACM MM 2023**
- **Write A Video: Automatic Video Editing System** Nov 2021 - Jul 2022
Advisor: Prof. Songhai Zhang *Graphics & Geometric Computing Group, Tsinghua University*
 - Proposed a 3-step pipeline that helped users to generate well-edited videos with rhythmical background music
 - Deployed a CLIP model on mobile devices; designed multiple effective algorithms for multi-label theme mapping, plot-based video clustering, and shot scoring
 - Simplified user input into text descriptions and choice making and received positive results in real-world datasets; this work served as the pre-survey for an in-process new product

PROJECTS EXPERIENCE

- **3D Aware Object Segmentation** May 2022 - June 2022
 - Worked on a course project on 3D Visual Computing; created a 3D-aware pipeline for object segmentation of RGBD images; implemented a three-step pipeline of background filtering, frustum reconstruction, and point cloud segmentation; outperformed the original 2d U-Net baseline by a clear margin
- **Smart GYM** Oct 2021 - Dec 2021
 - Worked on a course project focusing on HCI, an Oculus app developed with Unity
 - Designed various interactive patterns for users to control the sports equipment and exercise under smart guidance, conducted a set of user studies to prove its usability and robustness
- **Ray Tracer** Mar 2021 - Jun 2021
 - Completed a project for the course Fundamentals of Computer Graphic; studied a C++ image renderer based on a path-tracing algorithm; implemented multiple extended functions including depth of view, bump texture mapping, motion blur, volume light and Bezier surface rendering

- **Dexterous Robotic Hands Playing Ceramic Flute**

Jul 2020 - Sep 2020

- Used dexterous robotic hands to play ceramic flutes by controlling gestures and blowing rates
- Won the 3rd Prize and the Outstanding Work Award in the 2020 National Conference on Sound and Music Technology

HONORS AND AWARDS

- Excellent Comprehensive Scholarship at Tsinghua University (top 10 %), Dec 2021
- Excellent Athletic Scholarship at Tsinghua University, Nov 2021
- Five-star Volunteer at Tsinghua University, Jun 2021
- 2020 Rational Physics College Competition, First Place (top 10 %), Dec 2020
- 2019-2020 Outstanding Student at Tsinghua University (top 10 %), Oct 2020
- National Scholarship (top 2 %), Sep 2020
- 35th Chinese Physics Olympiad (Final), Second Award (top 0.1 %), Oct 2018

LEADERSHIP EXPERIENCES AND EXTRACURRICULAR WORK

- **Monitor of Class 95, Department of Computer Science and Technology:** Held various class activities, won the 2021 Excellence Class of Tsinghua University (top 5%) & 2021 Academic Excellence Class of Beijing.(July 2021 - July 2022)
- **Trainee, Tsinghua 13th XinHuo Program:** the XinHuo Program aims to train students to be the backbone of volunteer organizations. As a member of this program, I participated in over 300 hours of volunteer work and worked as the doping chaperone in the Beijing 2022 Winter Olympics. (Aug 2020 - May 2022)
- **Leader, Running Team of Computer Science Department:** Held weekly training and various snacks parties, won two consecutive championships (1/33) in the Tsinghua 10x1000m relay race. (Aug 2021 - Present)

SKILLS

- **Programming Languages:** C/C++, Python, Java, R, HTML/CSS, JS, Assembly, C#
- **Tools and Frameworks:** Git, Latex, PyTorch, Vue, Django, Qt, Linux, Bash, Jittor
- **Sports:** soccer school team, Champion of the 2020 Beijing University Soccer League; track and field school team