Yulu Pan

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Education

University of North Carolina at Chapel Hill — Chapel Hill, NC
M.S. in Computer Science — *Aug. 2023 – May 2025 (Expected)*
- Advisor: Prof. Gedas Bertasius

University of North Carolina at Chapel Hill — Chapel Hill, NC
B.S. in Computer Science and Mathematics, GPA: 3.74 / 4.0 — *Aug. 2021 – May 2023*

Brandeis University — Waltham, MA
Transferred, GPA: 3.94 / 4.0 — *Aug. 2019 – May 2021*

Research Interests

I'm broadly interested in **Computer Vision**, **Video Understanding**, and **AI for Health**. My current focus is on **fine-grained video understanding**, particularly in the areas of sports analytics and neuroscience. I'm also interested in **AI security**, especially for video data. I view video as a rich and valuable large-scale training source of knowledge, but I believe it must be utilized with careful attention to security and safety considerations.

Publications

- *Yulu Pan, Ce Zhang, and Gedas Bertasius.*
  BASKET: A Large-Scale Video Dataset for Fine-Grained Skill Estimation. **(Accepted to CVPR 2025)**
- *Akshay Paruchuri, Xin Liu, Yulu Pan, Shwetak Patel, Daniel McDuff, and Soumyadip Sengupta.*
  Motion Matters: Neural Motion Transfer for Better Camera Physiological Sensing. **(WACV 2024, Oral, Top 2.6%)** link
- *Jianjian Yin, Zhichao Zheng, Yulu Pan, Yanhui Gu, and Yi Chen.*
  Semi-Supervised Semantic Segmentation with Multi-Reliability and Multi-Level Feature Augmentation. **(Expert Systems with Applications, Volume 233, 15 December 2023, 120973)**

Experience

Graduate Research Assistant — Dec. 2023 – Present
UNC-Chapel Hill, Advisor: Prof. Gedas Bertasius — *Chapel Hill, NC*
- Curated a large-scale video dataset for fine-grained basketball skill estimation with over 4,400 hours and 32,000 participants for advancing video models in long-range, fine-grained recognition.
  (**Accepted to CVPR 2025**)
- Developed a 2M+ fine-grained QA dataset for VLM models across multiple sports (basketball, soccer, hockey) to enhance sports understanding and fine-grained action reasoning in vision-language models.

Graduate Research Assistant — Aug. 2023 – Present
UNC-Chapel Hill - Neuroscience Center, Advisor: Prof. Mark Zylka — *Chapel Hill, NC*
- Utilized various machine learning model structures, including 3D CNNs and video masked autoencoders, to automate spontaneous pain detection in mice.
- Deployed the model on a research platform utilized by 500+ researchers worldwide, enabling scalable and automated pain assessment in studies.

Research Assistant — Oct. 2022 – Aug. 2023
Nanjing Normal University, Advisor: Prof. Yi Chen — *Nanjing, China*
- Evaluated and refined a semi-supervised semantic segmentation framework, mitigating information loss and pixel category imbalance through various feature augmentation strategies to enhance model robustness.
- Managed resource allocation and conducted validation of experimental results across diverse datasets, ensuring comprehensive performance benchmarking of the model.
  (**Expert Systems with Applications, 2023**)

Research Assistant — Aug. 2022 – May. 2023
UNC-Chapel Hill, Advisor: Prof. Roni Sengupta — *Chapel Hill, NC*

- Conducted research in computer vision to tackle the challenge of robust, camera-based vital signs detection in dynamic environments.
- Curated and augmented datasets to investigate the preservation of remote photoplethysmography (rPPG) signals in motion transfer across videos, employing facial expression analysis techniques for data categorization and visualization.
(**WACV 2024** link)

Summer Research Assistant Jun. 2021 – Aug. 2021
Nanjing University Natural Language Processing Lab *Nanjing, China*

- Extracted and cleaned provincial and national policy data with Python web scraping.
- Leveraged various deep learning architectures to execute complex text classification tasks, and visualized hierarchical relationships using knowledge graphs for enhanced interpretability.

Teaching Experience

UNC-Chapel Hill Aug. 2022 – May. 2023
Undergraduate Learning Assistant *Chapel Hill, NC*

Brandeis University Jun. 2020 – May. 2021
Teaching Assistant *Waltham, MA*

- Collaborated with professors with holding office hours, exams write up and grading on topics such as data structures, object-oriented programming concepts, code organization for large project, industry standard developing tools in Java.
- Designed and led TA teams with weekly recitations for course material practice and answering students' questions.

Projects

Mobile APP: UNC Golf Jan. 2024 – May. 2024
Software Engineer *Chapel Hill, NC*

- UNC Golf is an iOS mobile App designed for the UNC-Chapel HIll Golf team for drill practice and NCAA athlete recruiting.
- Utilized SwiftUI to design a user-friendly interface, enhancing the team's ability to organize and optimize practice sessions.
- Led the integration and management of Firebase for database operations and streamlined data flow within the application.
(App Store Link)