







# ShengYun (Anthony) Peng

My research focuses on the machine learning security of multimodal foundation models, developing generalizable principles for high-performance robust architectures. My work spans a wide range of application areas, including multi-task robust tracking in computer vision and document understanding with vision-language models.

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 Google Scholar

## Education

- Jan. 2022 — present **Ph.D. in Computer Science**  
Georgia Institute of Technology, Atlanta, GA  
Advisor: Duen Horng Chau
- Jan. 2021 — Dec. 2022 **M.S. in Computer Science**  
Georgia Institute of Technology, Atlanta, GA  
GPA: 4.00/4.00
- Sept. 2015 — June 2020 **B.Eng. in Civil Engineering**  
Tongji University, Shanghai, China  
GPA: 92.37/100, Outstanding Graduates Award of Shanghai, 2020
- July 2019 — Sept. 2019 **Cross-disciplinary Scholars in Science and Technology (CSST) Program**  
University of California, Los Angeles, Los Angeles, CA  
GPA: 4.00/4.00

## Industry Research Experience

- May 2022 — Aug. 2022 **Intel Corporation**, Hillsboro, OR  
*Graduate ML Security Intern, Security Solution Lab*  
Mentor: Weilin Xu, Jason Martin  
Worked on DARPA Guaranteeing AI Robustness Against Deception (GARD) project; Investigated four key architectural components underpinning SOTA CNNs and Transformers that boost adversarial robustness.

## Academic Research Experience

- May 2021 — present **Georgia Institute of Technology**, Atlanta, GA  
*Graduate Research Assistant, School of Computer Science*  
Mentor: Duen Horng Chau  
Member of Polo Club of Data Science where we bridge and innovate at the intersection of data mining and human-computer interaction to synthesize scalable, interactive, and interpretable tools that amplify human's ability to understand and interact with big data.
- Sept. 2020 — Dec. 2020 **Fudan University**, Shanghai, China  
*Undergraduate Research Assistant, Shanghai Key Laboratory of Data Science*  
Mentor: Weidong Yang  
Built a cockpit monitoring software that can locate the dashboard, extract the plane's status parameters, and interactively verify the correctness based on human guidance.
- Oct. 2017 — Aug. 2020 **Tongji University**, Shanghai, China  
*Undergraduate Research Assistant, State Key Laboratory of Disaster Reduction in Civil Engineering*  
Mentor: Ying Zhou  
Developed a framework from the ground-up which identified structural system through a non-contact measurement method, which was widely used by multiple cities for structural health monitoring in China.

July 2018 — Jan. 2020

**Shanghai Jiao Tong University**, Shanghai, China

*Undergraduate Research Assistant, Advanced Avionics and Intelligent Information Lab*

Mentor: Xingcheng Zhang, Gang Xiao

Developed visible and infrared fusion methods on both pixel and feature levels, which solved tracking challenges including partial occlusion and low illumination. The tracker ranked first on large-scale RGBT234 tracking benchmark.

July 2019 — Dec. 2019

**University of California, Los Angeles**, Los Angeles, CA

*Undergraduate Research Assistant, Design Automation Lab*

Mentor: Yunxuan Yu, Lei He

Proposed a novel anchor-free tracker that achieved SOTA performances on widely-used tracking benchmarks, e.g., OTB2015, VOT2015, VOT2016, and TrackingNet.

Apr. 2017 — Apr. 2018

**Tongji University**, Shanghai, China

*Undergraduate Research Assistant, School of Materials Science and Engineering*

Mentor: Qianrong Yang

Mechanical design and manufacture of a 3D concrete printer with automatic pulp feeding systems.

June 2017 — Aug. 2017

**Chinese Academy of Sciences**, Beijing, China

*Undergraduate Research Assistant, Institute of Computing Technology*

Mentor: Chao Liu

PID control in Matlab Simulink for cruise missile and Cessna-172 aircraft flight.

## Honors and Awards

2023 BMVC 2023 Best Poster Award

Only five of the accepted papers are selected for the award

2020 Outstanding Graduates in Shanghai

For top 5% undergraduates graduating in 2020.

2017 — 2018 National Scholarship

Stipend awarded to top 2% undergraduates in all China's universities.

2017 — 2018 Tongji University Excellent Student

For top 5% undergraduates in Tongji University.

2016 — 2017 First Prize of Tongji University Scholarship of Excellence

For outstanding undergraduates in Tongji University.

2016 — 2017 Excellent Worker in the ASCE-Tongji-ISG of the Instructional Innovation

For my work at ASCE-Tongji-ISG club.

2017 National Undergraduate Innovative Programs Certificate

For our research in "3D Printing of Concrete Structures and Sample Strength Tests".

2017 3rd Prize in Contemporary Undergraduate Mathematical Contest in Modeling

We worked on the second problem, which was creating a price model for a specific photo service.

2016 1st Prize in Mathematics Competition of Chinese College Students

The competition examines advanced calculus and linear algebra knowledge.

## Publications

**High-Performance Transformers for Table Structure Recognition Need Early Convolutions**

ShengYun Peng, Seongmin Lee, Xiaojing Wang, Raji Balasubramaniyan, Duen Horng Chau

*Neural Information Processing Systems (NeurIPS) TRL Workshop. 2023.*

[Project](#) [PDF](#) [Code](#) [BibTeX](#) [Oral](#)

**Robust Principles: Architectural Design Principles for Adversarially Robust CNNs**

ShengYun Peng, Weilin Xu, Cory Cornelius, Matthew Hull, Kevin Li, Rahul Duggal, Mansi Phute, Duen Horng Chau, Jason Martin

*British Machine Vision Conference (BMVC). 2023.*

[Project](#) [PDF](#) [Video](#) [Poster](#) [Code](#) [BibTeX](#) [Best Poster Award](#)

**Diffusion Explorer: Visual Explanation for Text-to-image Stable Diffusion**

Seongmin Lee, Benjamin Hoover, Hendrik Strobelt, Zijie J. Wang, ShengYun Peng, Austin Wright, Kevin Li, Haekyu Park, Haoyang Yang, Duen Horng Chau

*IEEE Visualization Conference (VIS). 2023.*

[Project](#) [Demo](#) [PDF](#) [Recording](#) [Code](#) [BibTeX](#)

### **SkeleVision: Towards Adversarial Resiliency of Person Tracking with Multi-Task Learning**

Nilaksh Das, ShengYun Peng, Duen Horng Chau

*European Conference on Computer Vision (ECCV) AROW Workshop. 2022.*

[Project](#) [PDF](#) [Code](#) [BibTeX](#)

### **DetectorDetective: Investigating the Effects of Adversarial Examples on Object Detectors**

Sivapriya Vellaichamy, Matthew Hull, Zijie J. Wang, Nilaksh Das, ShengYun Peng, Haekyu Park, Duen Horng Chau

*CVPR Demo. 2022.*

[Project](#) [PDF](#) [BibTeX](#)

### **A novel DNN tracking algorithm for structural system identification**

ShengYun Peng, LingFeng Yan, Bin He, Ying Zhou

*Smart Structures and Systems. 2021.*

[Project](#) [PDF](#) [Video](#) [BibTeX](#) [DOI](#)

### **DSiamMFT: An RGB-T fusion tracking method via dynamic Siamese networks using multi-layer feature fusion**

Xingchen Zhang, Ping Ye, ShengYun Peng, Jun Liu, Gang Xiao

*Signal Processing, Image Communication. 2020.*

[Project](#) [PDF](#) [BibTeX](#) [DOI](#)

### **Anti-occlusion object tracking based on correlation filter**

Jun Liu, Gang Xiao, Xingchen Zhang, Ping Ye, Xingzhong Xiong, ShengYun Peng

*Signal, Image and Video Processing. 2019.*

[Project](#) [PDF](#) [BibTeX](#) [DOI](#)

### **SiamFT: An RGB-Infrared Fusion Tracking Method via Fully Convolutional Siamese Networks**

Xingchen Zhang, Ping Ye, ShengYun Peng, Jun Liu, Ke Gong, Gang Xiao

*IEEE Access. 2019.*

[Project](#) [PDF](#) [BibTeX](#) [DOI](#)

### **Object Fusion Tracking Based on Visible and Infrared Images Using Fully Convolutional Siamese Networks**

Xingchen Zhang, Ping Ye, Dan Qiao, Junhao Zhao, ShengYun Peng, Gang Xiao

*22th International Conference on Information Fusion (FUSION). 2019.*

[Project](#) [PDF](#) [BibTeX](#) [DOI](#)

## Preprint

### **LLM Self Defense: By Self Examination, LLMs Know They Are Being Tricked**

Mansi Phute, Alec Helbling, Matthew Hull, ShengYun Peng, Sebastian Szyller, Cory Cornelius, Duen Horng Chau

*arXiv. 2023.*

[Project](#) [PDF](#) [BibTeX](#)

### **RobArch: Designing Robust Architectures against Adversarial Attacks**

ShengYun Peng, Weilin Xu, Cory Cornelius, Kevin Li, Rahul Duggal, Duen Horng Chau, Jason Martin

*arXiv. 2023.*

[Project](#) [PDF](#) [BibTeX](#)

### **IMB-NAS: Neural Architecture Search for Imbalanced Datasets**

Rahul Duggal, ShengYun Peng, Hao Zhou, Duen Horng Chau

*arXiv. 2022.*

[Project](#) [PDF](#) [BibTeX](#)

### **Accurate Anchor Free Tracking**

ShengYun Peng, Yunxuan Yu, Kun Wang, Lei He

*arXiv. 2020.*

[Project](#) [PDF](#) [BibTeX](#)

## Invited Talks and Presentations

### **Robust Principles**

Oct. 2023	DARPA GARD PI Meeting (Evaluation 7)
	<b>Exploration of Robust Model Architectures</b>
May 2023	DARPA GARD PI Meeting (Evaluation 6)
	<b>In Search of Robust Architectures against Adversarial Attacks</b>
Aug. 2022	Intel Labs (Internship Report)
	<b>A New Siamese-based Tracking for Structural Health Monitoring</b>
June 2019	International Workshop on Data Science in Civil Engineering

## Grants and Funding

2022 — 2023	<b>Document Understanding</b> Co-authored \$250,000 awarded research proposal from Automatic Data Processing (ADP), Inc. PIs: Duen Horng Chau, Chao Zhang, Srijan Kumar
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## Service

### Program Committee

SIAM International Conference on Data Mining (**SDM**) 2024

### Reviewer

Scientific Reports 2023

ICCV Workshop on Adversarial Robustness In the Real World 2023

IEEE Transactions on Cybernetics 2023

ICML Workshop on AdvML-Frontiers 2023

Signal Processing: Image Communication 2022

SN Applied Sciences 2022

Pattern Recognition 2020

IEEE Access 2020

### Member

2016 — 2017	American Society of Civil Engineers - Tongji ( <b>ASCE</b> )
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## Mentoring

Apr. 2023 — present	<b>Mansi Phute</b> <i>M.S. in Computer Science, Georgia Institute of Technology</i>
Aug. 2022 — May 2023	<b>Kevin Li</b> <i>B.S. in Computer Science, Georgia Institute of Technology</i> Now: ML Ph.D. at Carnegie Mellon University
May 2022 — May 2023	<b>Chakravarthy RVK</b> <i>M.S. in Analytics - Data Science, Georgia Institute of Technology</i>
Oct. 2021 — May 2022	<b>Sivapriya Vellaichamy</b> <i>M.S. in Computational Data Analytics, Georgia Institute of Technology</i> Now: AI Research Tech - Senior Associate at JPMorgan Chase

## References

**Dr. Polo Chau**, Associate Professor  
School of Computational Science and Engineering  
*Georgia Institute of Technology*  
[faculty.cc.gatech.edu/~dchau](http://faculty.cc.gatech.edu/~dchau)

**Dr. Lei He**, Professor  
School of Electrical and Computer Engineering  
*University of California, Los Angeles*

[eda.ee.ucla.edu/people/faculty.html](http://eda.ee.ucla.edu/people/faculty.html)

**Dr. Ying Zhou**, Professor  
College of Civil Engineering  
*Tongji University*

<https://www.journals.elsevier.com/resilient-cities-and-structures/editorial-board/ying-zhou>