

# Zhongze (Zachary) Tang

Ph.D. Candidate, He/Him

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## EDUCATION

**Rutgers, the State University of New Jersey**

**GPA 4.00**

*Doctor of Philosophy in Electrical and Computer Engineering*

Sep 2019 – Present

**University of Electronic Science and Technology of China (UESTC)**

**GPA 3.74**

*Bachelor of Engineering in Measurement & Control Technology and Instrumentation*

Aug 2014 – Jul 2018

## RESEARCH EXPERIENCE

**Privacy-Preserving Multimedia Mobile Cloud Computing System**

**Advisor:** [Dr. Sheng Wei](#)

- Designed a framework which employs confidential computing in the cloud to deploy the perturbation generator, which addresses the resource challenge while maintaining privacy. A neural compressor is specifically trained to effectively compress perturbed images to address the bandwidth challenge.

**Protective Perturbation for Image Recognition System**

**Advisor:** Dr. Sheng Wei

- Designed and trained a Protective Perturbation Generator, which creates protective perturbations in real-time that blur an image completely. The protected image can no longer be recognized by human vision anymore but can still be classified by neural networks as before, without accuracy loss.
- Working on extending the project from image classification models to other models like optical flow estimation (e.g., FlowNet2) and 3D Point Cloud classification (e.g., PointNet++).

**Power-efficient Edge-assisted VR Live Streaming System**

**Advisor:** Dr. Sheng Wei

- Participated in the development of an edge-assisted VR live streaming system, where the VR rendering is offloaded from the client to the edge for power savings, with viewport prediction and cropping enabled to keep a low MtoP latency.

**Security-preserving Volumetric Video Live Streaming System**

**Advisor:** Dr. Sheng Wei

- Developed a DASH-based end-to-end volumetric video streaming system, supporting VOD and live.
- Designed a content-aware perturbation generation algorithm (for VOD) and a real-time generative model (for live) to add perturbations to volumetric videos, to defense against face ID spoofing attempts.

**Towards a Healthy Eating Habits Using Wi-Fi (Master Thesis)**

**Advisor:** [Dr. Yingying Chen](#)

- Collected and extracted Channel State Information (CSI) from Wi-Fi signals.
- Used MATLAB and Support Vector Machine (SVM) to recognize and analyze the user's eating behaviors.

## TECHNICAL EXPERIENCE

**TangibleBlog**, <https://github.com/tangibleblog>

Aug 2022 - Now

*OpenSource Project*

- A Go-based blog framework. It runs as a standalone server or generates static files to deploy anywhere.
- A Node.js-based CLI client tool is provided to manage the blog contents. A set of APIs is further provided for mobile client APPs in the framework, and a Flutter-based mobile client is under development.

Star Studio of UESTC, Chengdu, China

Sep 2015 – May 2017

PHP Developer, System Administrator

- Participated in development and maintenance of several UESTC websites, e.g., UESTC BBS (using Discuz!) and the website for the Office of State-owned Assets of UESTC (using CodeIgniter).
- Found and fixed website vulnerabilities like XSS and CSRF.

## SKILLS

**Research:** multimedia system security & privacy; end-to-end video streaming; trusted cloud architecture

**Programming:** proficient in Python, JAVA, Go, Verilog; moderately proficient in C/C++, UNIX Shell, Kotlin

**Web Development:** Flask, Gin, SQL, Redis, PHP

**Mobile & IoT:** FPGA, Android, Arduino, Raspberry Pi

**Machine Learning:** PyTorch, Tensorflow

**DevOps:** Linux, Git, Docker, K8s, Confidential Containers

## PUBLICATIONS

- **Z. Tang**, H. Phan, X. Feng, B. Yuan, Y. Liu, S. Wei, "Security-Preserving Live 3D Video Surveillance", ACM Multimedia Systems Conference (**MMSys**), 2023.
- M. Ye, **Z. Tang**, H. Phan, Y. Xie, B. Yuan, S. Wei, "Visual Privacy Protection in Mobile Image Recognition Using Protective Perturbation", ACM Multimedia Systems Conference (**MMSys**), 2022.
- Z. Zhu, X. Feng, **Z. Tang**, N. Jiang, T. Guo, L. Xu, S. Wei, "Power-Efficient Live Virtual Reality Streaming Using Edge Offloading", Workshop on Network and Operating System Support for Digital Audio and Video (**NOSSDAV**), 2022.
- X. Feng, Y. Xie, M. Ye, **Z. Tang**, B. Yuan, S. Wei, "Fake Gradient: A Security and Privacy Protection Framework for DNN-based Image Classification", ACM Multimedia Conference (**MM**), 2021. (Acceptance rate:  $542/1942 = 27.9\%$ )
- **Z. Tang**, X. Feng, Y. Xie, H. Phan, T. Guo, B. Yuan, S. Wei, "VVSec: Securing Volumetric Video Streaming via Benign Use of Adversarial Perturbation", ACM Multimedia Conference (**MM**), 2020. (Acceptance rate:  $472/1698 = 27.8\%$ )

## ACTIVITIES & SERVICES

**Presenter**, "Privacy-Preserving Multimedia Mobile Cloud Computing", *Invited Talk* at IBM Jun 2023  
**Judge**, Rutgers ECE Capstone Expo Apr 2023  
**Reviewer**, NOSSDAV 2023 Mar 2023  
**Presenter**, "Security/Privacy-preserving Multimedia Cloud Services", Rutgers ECE Research Day Dec 2022  
**Student Volunteer**, HOST 2022, D.C. Jun 2022  
**Student Volunteer**, ICDCS 2021, Virtual Jul 2021  
**Student Volunteer**, 60<sup>th</sup> Anniversary Celebration of UESTC, Chengdu, China Sep 2016  
**Teacher as a volunteer**, Love of Wings Program, Qinghai Tibet Area, China Summer 2015

## TEACHING/MENTOR

**Instructor**, Rutgers ECE 231 & 233 Digital Logic Design & Laboratory Summer 2023  
**Co-Mentor**, Undergraduate Special Problem Spring & Fall 2022  
**Teaching Assistant**, Rutgers ECE 231 & 233 Digital Logic Design & Laboratory Fall 2020, 2021, 2022  
**Teaching Assistant**, Rutgers ECE 437 Digital Systems Design Fall 2019, 2023

## AWARDS

Student Travel Grant, HOST 2022, D.C. Jun 2022  
The People's First-Class Scholarship, UESTC, Chengdu, China 2016  
The People's Second-Class Scholarship, UESTC, Chengdu, China 2015, 2017