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Zhang Chao

Personal Profile

Although I majored in non-computer science disciplines during my undergraduate years, my fervor for technology and coding led me down a unique trajectory. As early as high school, I initiated self-studies in iOS development and delved into a Hackintosh project. In college, I independently honed skills in Windows Phone, Android, and Unity3D game development. This expertise culminated in the launch of gaming apps on the Windows Store, Google Play, and several Android markets in China. Following graduation, I served as a C++ software engineer, where I specialized in the development of foundational audio and video codecs. After gaining two years of industry experience, I embarked on a graduate program at Fudan University with a focus on computer vision and deepfake detection. Outside the realm of technology, my interests span gardening, aquarium, watercolor painting, aero-modelling, shopping, and cooking. My multifaceted journey reflects a spirit of continual exploration and an unwavering commitment to self-improvement.

Skills

Programming Languages	Python, C++
Tools	PyTorch, Visual Studio, SVN, Git, Markdown, Unity3D
Cloud services	Azure, Github
Specialized Skills	Linux, Deep Neural Networks, Media Codecs, Functional Programming, Quantum computing programing
Certification	Microsoft Certified: Azure AI Fundamentals Advanced Level of PAT, CET4, NCRE4

Education

- **Master of Computer Science** **Sep 2021 - Jan 2024 (expected)**

  Fudan University, Fudan Vision and Learning Laboratory

  Research Focus: AI, Computer Vision, Deepfake Detection

  Main courses: Neural Networks and Deep Learning, Machine Learning, Advanced Software Engineering

- **Double Bachelor's Degrees in Finance and Horticulture** **Sep 2013 - Jun 2017**

  Sichuan Agricultural University

  Finance Major: Studied Macroeconomics, Microeconomics, Accounting

  Horticulture Major: Studied Botany, Plant Physiology, Agrology

Work Experience

C++ Software Engineer **Jan 2018 - Feb 2020**

Glority Software *Hangzhou*

As a C++ software engineer, I was primarily responsible for the low-level codec aspects across multiple projects.

Projects:

- *Pinnacle Studio*, a video editing software on Windows.
  - Integrated AMD hardware acceleration.
  - Enhanced Video effect functionality to support 16bit frame.
  - Expanded software capabilities by adding new format support (4:2:2 10bit, ALAC, etc.).
  - Troubleshot and resolved issues related to media file import/export and codec.
- *Roxio Video Studio*, a video editing software on Windows.
  - Upgraded VisualStudio projects, enhancing software performance and stability.
  - Rectified various bugs related to DirectShow.
- *WinDVD Pro 12*, a Blu-ray player on Windows.
  - Updated the encryption key to ensure software security.
  - Identified and fixed a critical software bug using decompiler.

Key words: Media codec, C++, Windows development, Visual Studio, Microsoft Media Foundation, NVIDIA Video Codec SDK, Intel Media SDK, AMD Advanced Media Framework (AMF) SDK, DirectShow, COM, SVN

Project

NS_Upsampler **Jul 2023**

Real-time super-resolution program for Switch screen, personal project

- Implemented a real-time, low-latency super-resolution neural network using PyTorch, trained with self-collected data. Subsequently exported as an ONNX format model and deployed it into a Windows UWP application, enabling real-time enhancement of the 1080p display captured from Switch to 4K resolution. Currently under ongoing development and optimization.
- https://github.com/zhangchaosd/ns_upsampler
- Python, AI, ONNX, C#, Windows ML

The Hugging Face Course **Feb 2023**

Open-source course repository by Hugging Face

- Volunteered for localization of course videos, including translating and proofreading subtitles. After submitting PRs, they were merged into the main branch.
- https://github.com/huggingface/course

OpenTAI **Jun 2022**

University Project

- OpenTAI is an open-source platform dedicated to Trusted AI research, enabling researchers to quickly engage with new research directions, rapidly test new ideas, and conduct systematic offense and defense evaluations. In this project, I was responsible for backend service development for the deep fake segment.
- https://opentai.github.io/
- Python, Django, Deepfake, Docker

PyDeepFakeDet **Sep 2021**
Open-source tool for Deepfake detection model training and testing

- A tool for convenient training/reproduction of deepfake detection models. It currently includes GramNet, M2TR, MesoNet, F3Net, etc., and the number of models and supported datasets is still growing. As a primary contributor to the code, I built the entire tool framework and trained some of the models.
- https://github.com/wangjk666/PyDeepFakeDet
- Python, Computer Vision, Deepfake

Wireless Control System **Jan 2021**
Personal Project

- The workflow involves connecting an Xbox controller to a laptop. The laptop runs a client program that sends controller inputs. A Jetson Nano board connects to the laptop's hotspot, runs a server program to receive the controller control data, and then controls the electronic speed controller and servos.
- Python, C++, FPGA, UDP

YUVImagePlayer **Jan 2020**
Personal Project

- An image player that directly plays YUV or RGB data files. Supported formats: NV12, BGRA32, RGB24, RGBA32, YV12, YUY2, UYVY.
- https://apps.microsoft.com/store/detail/yuvimageplayer/9PB0KPJVW2Z2
- C++, UWP

ChalkMaster **Jan 2017**
A small game I developed independently during my undergraduate studies.

- A UWP game developed using Unity3D and C# language. It's available on the Microsoft Store with over 15,000 downloads to date.
- https://www.microsoft.com/zh-cn/p/chalkmaster/9nslfbsr0rzc
- C#, Unity 3D

Google Study Jams **Jan 2017**
Led a team of students to participate in the Google Study Jams event, learning Android app development, and successfully completed the course.

- Android Studio, Kotlin

Paper

- **Fighting Malicious Media Data: A Survey on Tampering Detection and Deepfake Detection**
  This paper delves into the increasing concern of media tampering through advanced deep learning techniques, distinguishing between image tampering and Deepfake techniques. It offers a comprehensive review of existing defense mechanisms in the realm of media tampering detection, and discusses the associated challenges, trends, and potential future research directions in this field.
  https://arxiv.org/abs/2212.05667

- **Comparative Study of Deepfake Detection Methods and Datasets**
  Evaluated and compared the performance of 13 existing deepfake detection models across multiple deepfake datasets. Investigated the impact of different deepfake training datasets on model performance. Still under review.