Hanke Chen

Website: cs.cmu.edu/~hankec
Github: github.com/kokecacao
Email: hanke@cmu.edu
LinkedIn: linkedin.com/in/chenhanke

Current Interests: I build artist-friendly systems from CV/CG research

Education

Carnegie Mellon University (CMU) — Pittsburgh, PA
Bachelor of Computer Science and Arts in Computer Science and Art — *Aug 2020 - No Planned Graduation Date*

Courses: Machine Learning, Deep Learning, AI for Robotics, Distributed System, Computer System, Computer Graphics, Theoretical CS, Theoretical Quantum Computing, Data Structures and Algorithms, Functional Programming, Compiler, Statistics, Probability, Generative Computer Vision (Graduate Level)

Sandy Spring Friends School (SSFS) — Silver Spring, MD
Graduated w/ Honor Thesis: Bengali A.I. Handwritten Grapheme Classification — *Aug 2016 - Jun 2020*

Skills

- **Languages**: C++, C, CUDA, Go, Java, Python, Solidity, SQL, SML, Dart, MATLAB, Javascript, HTML, CSS, GLSL
- **Frameworks**: PyTorch, Tensorflow, Keras, Nginx, ReactJS, MySQL, SQLite, Reddis, Flask, FastAPI, Flutter, GraphQL, GCP, Terraform, Docker, Kubernetes
- **PhysComp**: Linux, PCB Design, Soldering, STM32, Arduino, RaspberryPi, 3D Printing, Woodworking, CNC
- **Tools**: Unreal, Unity, Blender, Houdini, ZBrush, Processing, P5.js, FL Studio, AfterEffect, Fusion360

Experience

Stealth — Remote
Research and Development — *Sep 2023 - Present*

- **Skills**: Kubernetes, ReactJS, Reddis, Computer Graphics, Computer Vision

Midjourney — San Francisco, CA
Research and Development — *Jun 2023 - Sep 2023*

- Some secret research?

Wireless Sensing and Embedded System (WiSE) Lab @ CMU — Pittsburgh, PA
Research Assistance — *May 2022 - May 2023*

- **Skills**: CUDA Programming, C++, PyTorch, Machine Learning, Computer Graphics, Computer Vision
- **Spring 2023**: A 1-FPS realtime training pipeline of NeRF. (See FART-NeRF Below)
- **Summer 2022**: Worked with Prof.Anthony Rowe on accelerating hash-encoded Neural Radiance Field. Designed and implemented realtime ML training pipeline that leverage occupancy-grid guided sampling, CUDA kernels, and tetrahedral dilation to achieve 10x speedup in training time than state-of-the-art for 3D reconstruction on real-world bounded scenes.

DeepVocab @ CMU Olympus Incubator — Pittsburgh, PA
Co-founder, Machine Learning Engineer, Software Engineer — *Jun 2020 - Oct 2022*

- **Skills**: Computer Vision, Natural Language Processing, CI/CD, SQLite, HiveDB, Dart, Flutter, GraphQL, Nginx
- Managed the team of 8 people to design and develop the frontend+backend of an Android+IOS vocabulary-learning app that uses CV and NLP to predict memory decay. Implemented Model-View-ViewModel with Provider architecture for maintainability. β-testing on Testflight.

Robotics At Maryland (R@M) at UMD — Maryland, MD
Computer Vision Engineer — *2018 - 2020*

- **Skills**: OpenCV, PyTorch, Tensorboard
- Develop UMD club's underwater robotics object localization algorithm using Deep Learning for AUVSI & ONR's Robosub competition. Implemented & improved GradCam (2016) to perform semi-supervised segmentation w/ partially labeled data

KokiCraft Network — Remote
Founder, Software Engineer — *2014 - 2017*

- **Skills**: Java, MySQL, Game Engine Development, Network Programming
- Online game played by 300,000+ players. Most popular GTA Minecraft Server in MCBBS Forum. Player experience documented by influencer and streamers. Programmed large game backend logic and resource management engine & update new game features monthly. Implemented automatic hack client banning and prevented UDP flood.

Projects

KokiPad: An Experimental Keyboard May 2022 - Present
Designed, programmed, and manufactured ∞-rollover keyboard and driver. PCB is robust against differential signalling, ESD, and electrical surge. (PCB Design, Soldering, STM32, 3D Printing, CNC)

~~Quantum~~: A Quantum Computer Simulator Sep 2022 - Oct 2022
A CLI program to (inefficiently) simulate any quantum program analytically (Golang)

Scotty3D: A Blender-Like CAD Software May 2022 - Dec 2022
Programmed realtime rendering and ray-tracing pipeline. Designed algorithms for mesh editor, animation editor, and blackhole renderer with General Relativity, using various acceleration datastructure (C++, Computer Graphics)

Distributed Bitcoin Miner: A Mining Farm Protocol Aug 2022 - Dec 2022
A UDP-based system for distributed bitcoin mining. Robust against server & client failures. Designed and implemented fair scheduler and dynamic load-balance. Optimized for fast response. (Golang, Distributed System)

2ch3: A Web3 Social Media Owned by People Mar 2022
A Chrome plugin and contract on Gnosis chain (NodeJS, Solidity, Flask) [link]

~~MineShader~~: A Minecraft Shader Apr 2022
Reverse pixel shader significantly improve Minecraft graphics (GLSL, OpenGL)

RedstoneTorch: A Computer Vision Framework for Competitive Programing Jan 2018 - Jan 2020
A large pipeline built for Competitive Programming based on PyTorch with 2,000,000+ lines of code. [link]

Publications

FART-NeRF: Fast Accumulative Realtime Training of NeRF 1st author, in progress (*Jan '23*)
We proposed background separation, Occupancy Grid, Multi-Level Tensorized Page Table to build the first explicit high-res NeRF representation with low memory cost trained in 1FPS on 3 depth cameras.

Practical NeRFology: A Brief Commentary on Neural Radiance Fields 1st author, [link] (*Jan '23*)
A commentary on NeRF development related to depth priors, training speed, and dynamic scenes.

Extracting Cellular Location of Human Proteins Using Deep Learning 1st author, [link] (*Dec '18*)
Proposed a proteins modeling system with Residue+Squeeze-Excitation layers (and many tricks) to identify 27 cell types within 28 subcellular locations in microscopy images. System surpassed human accuracy by 35%.

Selected Awards & Honors

· **Non-Traditional Award** , Global Game Jam 2024 *Jan 2024*
· **Dean's List** ×3 , CMU School of Computer Science and College of Art *Aug 2020 - Dec 2022*
· **Frank Brunckhorst Presidential Schlp** ×3 , Carnegie Mellon University *2020-2023*
· **Regina Gouger Miller Art Scholarship** , Carnegie Mellon University *2020-2021*
· **Lv.2 Planet Award (Top 50, Global, Solo)** , DarkForest v0.6 Valhalla (Round 5: The Junk War) *Feb 2022*
· **Anna Ophelia Dowden Award** , CMU College of Art *Oct 2020*
· **Bronze Medal (Global, Team)** , Kaggle SIIM-ACR Pneumothorax Segmentation Competition *Jun 2019*
· **World 1st Place (Solo)** , Kaggle Histopathologic Cancer Detection Competition *Jan 2019*

Teaching, Volunteer, and Consulting

Paid Expert @ Gerson Lehrman Group, Inc. since *March 2024*

Consulting Expert @ Tegus, Inc. since *February 2024*

Instructor @ CMU StuCo 98-205 - Introduction to Minecraft Pittsburgh, PA
Designed course for technical Minecraft. Developed automatic grading and server infrastructure. Jan 2023 - Present

Project Lead and Technical Artist @ Game Creation Society Pittsburgh, PA
Led and worked with 3 teams on 3 video games. (Unreal, Unity, Blender, Houdini, ZBrush) May 2021 - Jun 2022

Network Security Consultant @ FIRST Robotics College Park, MD
Monitor network security by WiFi sniffing during regional FTC competition. (Wireshark) Jan 2018

Talks and Presentations

· **Neural Radiance Field** : It's NeRF or Nothing [link] (@ WiSE Lab, Aug.8 2022)

Open-Source Contribution

· **NeRFStudio** : a Neural Radiance Field Training Framework [link] *spherical harmonics rendering bug fix*
· **BottomNavigationBadge** : Flutter UI Component [link] *introudce breaking change and major bug fixes*
· **SQL Injection on Stanford's Website** : Occationally found the bug *found and reported the bug*

Games

· **Teledot** : a multiplayer strategy game [link] *Jan 2024*
· **SwingSimulator** : a meta-game [link] *Feb 2023*
· **CryptoEggs** : AI Generated Game on Gnosis Blockchain [link] *Jan 2022 - Jun 2022*
· **Project-Sapphire** : MMO Online FPS Game on Browser [link] *Jan 2021 - Jun 2021*
· **Winter** : a snow storm scene with Unity [link] *May 2021*

References

Nelson Zhang
Midjourney Inc.

CA 94107
nelson[at]altar[dot]ai

Prof. Anthony Rowe
Carnegie Mellon University
5000 Forbes Ave, Pittsburgh
PA 15213
agr[at]andrew[dot]cmu[dot]edu

Prof. Golan Levin
Carnegie Mellon University
5000 Forbes Ave, Pittsburgh
PA 15213
golan[at]andrew[dot]cmu[dot]edu

Tianshu Huang
Carnegie Mellon University
5000 Forbes Ave, Pittsburgh
PA 15213
tianshu2[at]andrew[dot]cmu[dot]edu