Joonbeom Park

Seoul, Republic of Korea.
joonb14@gmail.com
jb.park@yonsei.ac.kr
github: https://github.com/joonb14
gitpage: https://joonb14.github.io

Education

M.S in Computer Science, Yonsei University (February 2021)
B.S in Computer Science, Yonsei University (February 2019)

Research Experience

Software Engineer
Department of OS, Tmax Inc, Bundang, Korea
October 2022 ~ Present | Online Meeting Team

- Implemented C++ libtorch denoiser based on python PyTorch denoiser for Online Meeting solution based on Open WebRTC Toolkit(OWT) media server.
- Ongoing) Constructing gstreamer pipeline for utilizing C++ libtorch denoiser on OWT media server.
- Ongoing) Setting OWT analytics agent service on docker-compose environment

June 2022 ~ September 2022 | Virtual Desktop Solution Team

- Documentation of Tmax Virtual Desktop Solution(VDS)'s common library.
- Developed RTP/SRTP packet sender for WebRTC testing.

Game Server Developer
Department of Metaverse, Tmax Inc, Bundang, Korea
December 2021 ~ May 2022 | Metaverse Server Team

- Developed game server using Libuv which is Node.js core c++ library.
- Developed Unity client to test Libuv game server.

Machine Learning Researcher
Department of AI, Tmax Inc, Bundang, Korea
September 2021 ~ November 2021 | Computer Vision Team

- Developed realtime pose estimation with Unity 3D avatar on smartphones using BlazePose(Google Mediapipe).

May 2021 ~ June 2021 | Computer Vision Team

- NVIDIA Triton server inference system maintenance

February 2021 ~ August 2021 | Computer Vision Team

- Developed a face recognition algorithm HyperFace which certified KISA(K-NBTC) BIO Authentication test(ISO/IEC JTC1 SC37 standard).
- Developed realtime face recognition Android application using Google Android ML Kit.

Graduate Researcher
Department of Computer Science, Yonsei University, Seoul, Korea
March 2019 ~ February 2021 | Mobile Embedded System Lab | Advisor: Professor Hojung Cha

- Developed a gaze data collecting application for Android using Google Android ML Kit.
- Developed a convolution neural network for realtime gaze estimation model on smartphones using Tensorflow Lite.
- Developed an Android application for realtime gaze estimation with front facing camera on smartphones using Google Android ML Kit.

Undergraduate Researcher
Department of Computer Science, Yonsei University, Seoul, Korea
December 2017 ~ February 2019 | Mobile Embedded System Lab | Advisor: Professor Hojung Cha

- Developed a SVM model for estimating power consumption of smartphone(Pixel XL) display based on the RGB values of screen display.
- Developed energy aware UI design tool utilizing the SVM model, and image clustering.
- Developed iBeacon logger application for Android, and visualization tool on web browser using Highcharts and GoJS.

Paper

GAZEL: Runtime Gaze Tracking for Smartphones

2021 IEEE International Conference on Pervasive Computing and Communications (PerCom)
DOI: 10.1109/PERCOM50583.2021.9439113
J. Park, S. Park, H. Cha, "GAZEL: Runtime Gaze Tracking for Smartphones," *The 19th International Conference on Pervasive Computing and Communications (PerCom 2021), Virtual Conference*, Mar. 22-26, 2021.

Projects

Porting python denoiser module to Tmax Online Meeting solution, Tmax OS
October 2022 ~ Present

- Converting PyTorch denoiser model to C++ torchscript model which is customized from FaceBook denoiser project.
- Converting python denoiser inference script to C++ libtorch code.
- Applying the model to Node.js Tmax Online Meeting based on Open WebRTC Toolkit Media Server (On progress).

Documentation and testing for Virtual Destktop Soultion (VDS), Tmax OS
June 2022 ~ September 2022

- Writing guidelines for using VDS common library, especially for establishing TCP/WebSocket Channel connection, and Signaling interface in VDS.
- For testing VDS server, developed RTP/SRTP media packet sender.

Game server development using Libuv, Tmax Metaverse
December 2021 ~ May 2022

- Developing C++ Metaverse Game Server with Libuv(Node.js core library) for C# Unity Client. Demo.
- **TCP** Server for realtime multiplayer games.
- Designing packet protocol for Metaverse server and Unity cleint.
- Handling 100+ players in a **stateful** Metaverse server.

Realtime 3D pose estimation on smartphones with Unity, Tmax AI
September 2021 ~ November 2021

- Developed realtime pose estimation with Unity 3D avatar on smartphones using BlazePose(Google Mediapipe) with Unity Barracuda.
- Modified BlazePoseBarracuda & ThreeDPoseUnityBarracuda for development.
- Optimized application to meet 16 FPS on Galaxy S21.
- Demo.

NVIDIA Triton Server Maintenance, Tmax AI
May 2021 ~ June 2021

- Deployed our team's deep learning models with NVIDIA Triton Server on Tmax HyperCloud(customised k8s)
- (Deprecated) Used Flask gateway for pre & post processing
- Modified input stream format. JSON to byte buffer
- Changed pre & post processing to use Ensemble + Python BLS pipeline

Face recognition algorithm development, Tmax AI
February 2021 ~ August 2021

- Implemented face recognition algorithms on TensorFlow 2
- Converted TensorFlow 2 model to TensorFlow Lite
- Applied uint8 quantization on TensorFlow Lite model.
- Developed realtime face recognition PC/Android application using OpenCV/Android ML Kit and IJB-C dataset. Android Demo.
- Further developed *HyperFace* face recognition algorithm to get KISA(K-NBTC) BIO Authentication test(ISO/IEC JTC1 SC37 standard) certified.
- Developed *Face Bird* game application with *HyperFace*. Demo.

Realtime gaze estimation on smartphones, Yonsei University
March 2019 ~ February 2021 | Advisor: Professor Hojung Cha

- Developed realtime eye region Bitmap cropper, and landmark collector with Google Android ML Kit.
- Developed button click based auto gaze data collecting application for Android using Google Android ML Kit.
- Developed Android laucher application for gaze data collection.

- Developed a light-weight convolution neural network for realtime gaze estimation model on smartphones using TensorFlow Lite.
- Used tablet gaze data for training, applied linear regression to use this model on smartphones.
- Utilized RenderScript for converting RGB image to 1 channel Black & White image.
- Developed an Android application for realtime gaze estimation with front facing camera on smartphones using Google Android ML Kit.
- *GAZEL: Runtime Gaze Tracking for Smartphones* paper publication.
- Developed *Gaze Bird* game application with *GAZEL*. Demo.

Power management on embedded systems, Yonsei University
December 2017 ~ February 2019 | Advisor: Professor Hojung Cha

- Developed a SVM model for estimating power consumption of smartphone(Pixel XL) display based on the RGB values of screen display using Monsoon ADB.
- To decrease power consumption on smartphones, developed *Energy Aware UI Design Tool* which runs on Flask. ver1. ver2.
- Developed iBeacon logger application for Android, and visualization tool on web browser using Highcharts and GoJS.

Social

Teacher at Daesung high school, Daesung high school Seoul, Korea.
September 2017 ~ December 2017, Teacher

- Taught C++ programming for high school students on weekends.

Selected Coursework

Yonsei University(Undergraduate)

- Freshman
  - Computer Programming
  - Object Oriented Programming
- Sophomore
  - Data Structure
  - Internet Programming
  - Computer System
  - Logic Circuit Design
  - Digital Logic Circuit Practice
  - Programming Language Structure Theory
- Junior
  - Operating System
  - Computer Architecture
  - Computer Graphics
  - A.I
  - Computer Network
  - Database

    - System Programming
    - Algorithm Analysis
- Senior
    - Compiler Design
    - Human-computer Interface
    - Information Protection
    - Software Comprehensive Design (1)
    - Software Comprehensive Design (2)

Yonsei University(Graduate)

- Database System
- Multicore Programming Basics
- Wireless Network Technology Special Lecture
- Computer System Special Lecture
- Dependable Computer System
- Dependable Computing Special Lecture

Skills

Dev. Languages: C++, Java(Android Studio), Python, JavaScript