

# Joonbeom Park

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## Experience

### Infra & Backend & MLOps

#### [shot up](#)

January 2025 ~ Present | Aug Team

- [Designed Serverless infrastructure](#) & implementation.
- [Screenshot analyzing with AI Agent\(LLM + VectorDB for RAG\)](#)
- [Semantic search for saved screenshots.](#)
- Deployed most of the AWS resources with AWS CDK(IaC).

#### [aug: spacial social](#)

September 2023 ~ Present | Aug Team

- [Designed Serverless event-driven infrastructure](#) & implementation.
- [Video streaming & image content delivery.](#)
- GeoLocation-based AR Social Networking Service.
- Deployed most of the AWS resources with AWS CDK(IaC).

Global Solutions Technology, SK Telecom, Pangyo, Korea

February 2023 ~ Present | Security AI Development Team

- [Designed CVOps architecture\(MLOps for AI surveillance cameras\)](#) & Implementation.
- [Designed CVOps data pipeline](#) & Implementation.
- Implemented image and data content delivery service.
- implemented model train, inference, conversion, deploy pipeline for surveillance cameras.
- Developed semantic image search.
- Co-Dev with AWS Engineers(AWS Fathom)
- Implemented batch inference API server for radio tower anomaly detection with drone images.
- Deployed most of the AWS resources with AWS CDK(IaC).

### Software Engineer

Department of OS, Tmax Inc, Bundang, Korea

October 2022 ~ January 2023 | Online Meeting Team

- Implemented C++ libtorch denoiser based on python PyTorch denoiser for Online Meeting solution based on Open WebRTC Toolkit(OWT) media server.

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(Node.js core c++ library).
- Developed Unity client to test Libuv game server.

## Machine Learning Engineer

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

- Granted KISA(K-NBTC) BIO Authentication test(ISO/IEC JTC1 SC37 standard) certification with face recognition algorithm HyperFace.
- 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.

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## Paper

### **GAZEL: Runtime Gaze Tracking for Smartphones**

2021 IEEE International Conference on Pervasive Computing and Communications (PerCom)

DOI: [10.1109/PERCOM50583.2021.9439113](https://doi.org/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.

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## Projects

### **Shot Up: AI Assistant for Screenshots**, with Gunhee Han, Harry Kim, Hojin Joo

January 2025 ~ Present

[AppStore Link](#)

- Design and deploy the AWS resources with AWS CDK.
- Firebase authentication with Google & Apple login.
- Mobile push notification with AWS SNS, Firebase Cloud Message(FCM).
- Business logic with Lambda Function URL(to support streaming responses) + CloudFront distribution
- Lambda@Edge authentication for CloudFront origins
- OpenSearch Serverless vector collection and AWS Bedrock & ChatGPT for semantic search

### **Aug: Location-based AR Social Network Service**, with Gunhee Han, Harry Kim, Hojin Joo

September 2023 ~ Present

[AppStore Link](#)

- Design and deploy the AWS resources with AWS CDK.
- Firebase authentication with email & password, Google login, Apple login.
- Mobile push notification with AWS SNS, Firebase Cloud Message(FCM).
- Video streaming & image content distribution with AWS Route53, CloudFront, S3.
- Automatic thumbnail creation with AWS S3, Lambda trigger.
- Automatic HLS conversion for videos with AWS S3, Lambda trigger, MediaConvert.
- Business logic with Event-driven architecture. Using only serverless resources, AWS REST API Gateway, EventBridge, Lambda, DynamoDB.
- Geolocation-based content search API based on Mapbox quadkey.

### **MLOps pipeline for AI Surveillance Cameras(CVOps)**, SK Telecom

February 2023 ~ Present

- Design and deploy the AWS resources with AWS CDK.
- User Authentication with AWS Cognito.
- Dataset management with AWS Fathom(co-developing service with SKT) SDK.
- Image preview and data streaming middleware service with AWS CloudFront + ALB + Fargate + Fathom SDK
- Training pipeline with Sagemaker TrainingJob. Progress update, logging implemented with AWS SQS, Lambda.

- Inference pipeline with Sagemaker ProcessingJob. Progress update, logging implemented with AWS SQS, Lambda.
- Implementing Conversion pipeline, Torch to ONNX to binary file conversion. Each feature uses SageMaker ProcessingJob for conversion. Orchestrating workflow with Step Function.
- Pipeline(Train, Inference, Conversion) implementation with AWS Step Function.
- Model deployment API with AWS API Gateway, ALB, Fargate, FastAPI. Updated AI model download logic integration with S3 presigned URL.
- Semantic image search with AWS OpenSearch. Feature extraction with OpenCLIP on Fargate.

### **Anomaly detection(with drone images) service for radio towers, SK Telecom**

June 2023 ~ August 2023

- Whole AWS infrastructure with AWS CDK(IaC).
- VPC & NAT Gateway for security requirements.
- Batch inference anomaly detection model with AWS Sagemaker ProcessingJob to only use instance on-demand(Serverless Service).
- Handling non-code level errors such as AWS Sagemaker resource errors with AWS Step Functions. Triggering AWS Lambda if errors occur, then report it to the server.

### **Porting python denoiser module to Tmax Online Meeting solution, Tmax OS**

October 2022 ~ December 2022

- 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 Desktop Soution (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 client.
- 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 launcher 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.
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## 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.
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## Education

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

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

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## Skills

**Dev. Languages:** AWS, CDK, Python, TypeScript, C++, Java(Android Studio)