CHANG, YUNBIN

VISION & SOFTWARE ENGINEER

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PROFILE

Backend & Machine Vision Engineer with 2+ years of hands-on experience in backend development, vision software, and hardware-integrated systems. Passionate about computer science from an early age, admitted through a software talent track, and graduated early with a full national STEM scholarship. While still an undergraduate, gained hands-on experience through roles in both academic labs and companies, leading full-cycle projects in semiconductor inspection and e-commerce. A vision project at *Deepseers* was consecutively selected for the TIPS and DIPS R&D programs, highlighting its technical and commercial potential. Explored AI through memory-efficient GAN research and a patented deep learning–based ROI recommendation method. Served as a KATUSA in U.S. Forces Korea, strengthening global collaboration and data management skills.

SUMMARY OF EXPERIENCE

- **Scalable Architecture Design**
  - Independently developed modular C#/.NET-based vision software to replace rigid legacy systems, adaptable to diverse industrial hardware, which streamlined on-site setup and significantly reduced engineering overhead.
  - Ensured modular extensibility for adding new heterogeneous equipment types.
  - Architected a flexible structure to handle multiple devices and inspection scenarios using dynamic recipes.
  - Developed inspection history databases and LOT-tracking systems using SQLite and C#.
  - Integrated EMAP/X-out upstream interface for real-time defect mapping and synchronized data flow.
- **Hardware-Integrated Software Development**
  - Integrated UDP communication between vision software and machine handler.
  - Implemented vision systems with Camera Link, GigE interfaces, strobe lighting, and trigger logic.
  - Prevented frame loss in high-speed inspections by designing an asynchronous trigger-handling pipeline using an Observer-based blocking image queue.
  - Implemented high-speed flying inspection using strobe illumination and hardware-trigger synchronization for precise image acquisition during motion.
  - Enabled recipe-based automatic lighting control for RS232-based illumination systems.
- **Machine Vision**
  - Developed and optimized semiconductor package inspection algorithms using C#, WPF, and Halcon.
  - Designed a multi-shot illumination strategy, capturing images under varying light conditions optimized for defect types, improving detection over single-light setups.
  - Created a patch-based, memory-efficient conditional GAN framework for sub-region image synthesis.
- **Backend & Cloud Infrastructure Development**
  - Built a scalable backend and infrastructure for a dropshipping platform, integrating logistics, payments, and admin systems with full-stack implementation.
  - Designed and implemented RESTful APIs for "THEKOC" dropshipping platform using Node.js and TypeScript.
  - Architected AWS infrastructure (EC2, S3, LB, RDS, ElastiCache, Nginx) to support high-availability services.
  - Streamlined end-to-end dropshipping operations by developing product, order, and review management modules, and automating shipping workflows through seamless integration with QExpress warehouse via the SCM system.

EDUCATION

HANSUNG UNIVERSITY,
B.S. IN COMPUTER SCIENCE AND ENGINEERING
📍 Seoul, South Korea   📅 Mar 2019 - Aug 2024

Honors: GPA: 4.27/4.5 (Major 4.43)
- Early Graduation
- Admitted via Software Talent Pathway (SW 특기자 전형)
- National Science & Technology Scholarship (국가우수장학금 이공계)
  - Full Tuition for Junior & Senior Years
- Highest Academic Excellence Scholarship (최우수한성인재 장학금)
  - 70% tuition coverage for sophomore year

- Academic Excellence Scholarship (우수한성역량장학금)
  - 50% tuition coverage (1st semester), 30% (2nd semester) in freshman year

PROFESSIONAL & OTHER EXPERIENCE

DEEPSEERS
📍 Seoul, South Korea

VISION & SOFTWARE ENGINEER
📅 Feb 2024 – Till now

Project: Semiconductor Vision Inspection Solution **Client:** Genesem
Role(s): Software Engineer **Technologies:** C#, WPF, Halcon, SQLite
Responsibilities:

- Joined a startup spin-off from the university lab, continuing the same projects and responsibilities.
- *System Architecture & Core Module Development*
  - Designed system-wide architecture from scratch and technically led core module development.
  - Implemented Observer + Blocking Queue-based trigger-grab sync for high-speed flying inspections.
  - Developed adaptive multi-material recipe structure and integrated EMAP/X-out upstream data flow.
  - Built database for LOT management and inspection history tracking.
- *Vision Inspection & Algorithm Development*
  - Led development of mapping vision inspection algorithms (including marking side) from architecture to deployment.
  - Enabled dynamic switching between bottom and marking-side inspections in mapping and PRS, improving equipment flexibility.
  - Contributed to vision algorithm optimization by improving shape matching efficiency through selective learning of key transformation-relevant regions, leading to reduced alignment time.
  - Filed patent for deep-learning-based ROI recommendation algorithm.
- *Hardware Integration & Control*
  - Implemented trigger/strobe lighting control and performed hardware troubleshooting.
  - Integrated heterogeneous camera interfaces and illumination with minimal setup via dynamic configurations.
  - Developed handler-vision socket protocol and routing logic to the appropriate controller, enabling compatibility across different machine types (e.g., tray or ring).
  - Developed LOT and recipe synchronization and history management between the handler and vision system.

AML LAB. HANSUNG UNIVERSITY
📍 Seoul, South Korea

UNDERGRADUATE RESEARCHER
📅 May 2023 - Feb 2024

Project: Semiconductor Vision Inspection Solution **Client:** N/A
Role(s): Software Engineer **Technologies:** C#, WPF, Halcon, SQLite
Responsibilities:

- Developed vision inspection software for semiconductor package equipment (Saw Singulation), from early-stage prototyping to deployment.
- Conducted in-lab deployment and validation of prototype software on real semiconductor equipment to ensure stable and real-time operation.
- Contributed to the development of all algorithms used in semiconductor package mapping inspection, including marking-side inspection.
- Supported the implementation and parameter optimization of bottom-side inspection algorithms through collaborative testing and feedback.

Project: Researched Memory Efficient GAN Framework **Client:** N/A
Role(s): Researcher **Technologies:** Python, Pytorch, Numpy
Responsibilities:

- Conducted research on a patch-based memory-efficient GAN framework for high-resolution image generation.
- Published 1 paper in a KCI-registered journal.
- Presented at 1 domestic (oral) and 1 international (poster) academic conference.
- Received Best Paper Award at HCI2024 oral presentation.

STAFACT INC.

📍 Seoul, South Korea

BACKEND DEVELOPER

📅 Jun 2022 - May 2023

Project: Developed Dropshipping Platform "THEKOC"

Client: In-house

Role(s): Backend Developer

Technologies: Node.Js, TypeScript, MySQL, AWS

Responsibilities:

- Sole contributor to all public/private API development.
- Built and managed AWS-based cloud infrastructure, ensuring high availability using set of AWS EC2, S3, LB, RDS, ElastiCache and Nginx.
- Integrated social login with Kakao, Naver, Google, Apple, and Facebook.
- Integrated global payment systems (PayPal, WeChat Pay, MoMo).
- Integrated domestic payment systems (Toss Payments, KakaoPay, Naver Pay).
- Fully developed admin dashboard and management functionalities.
- Built seller mini-shop creation and personalized pricing features.
- Developed KakaoTalk notification and verification system.
- Built refund system for sellers' sales earnings.
- Contributed more than 30% to the front-end based on the number of commits using Nuxt.

Project: Developed an in-house SCM system

Client: In-house

Role(s): Backend Developer, QA Engineer

Technologies: Node.Js, TypeScript, MySQL, AWS

Responsibilities:

- automated shipping integration between QExpress warehouse and SCM.
- Linked in-house SCM with product, order, and review management modules.
- Developed product/order management and influencer trial (sampling) features.

UNITED STATED FORCES KOREA(USFK), HQ
UNITED NATIONS COMMAND(UNC)

📍 Camp Humphreys, South Korea

KATUSA, J1 DATA MANAGEMENT

📅 Dec 2020 - Jun 2022

Project: Database Management & Personnel

Role(s): KATUSA, HR Specialist(42A)

Responsibilities:

- Managed over 10,000 user records in the Personnel Information Management System-Korea (PIMS-K), ensuring accuracy and data integrity across multiple commands.
- Revitalized the command's duty-free purchase violation tracking system in accordance with USFK Regulation 60-1, by implementing monthly reporting for over 60,000+ beneficiaries across all USFK areas.
- Provided bilingual support in compiling and translating weekly strength and accountability reports for senior USFK leadership.
- Managed multinational personnel in-processing, including United Nations Command (UNC) forces, during Combined Command Post Training (CCPT) period.

Project: Policy & Program

Role(s): KATUSA, HR Specialist(42A)

Responsibilities:

- Processed more than 200 Exception to Policy for US embassy employees and Service member's dependents.
- Strengthened collaboration between USFK and Combined Forces Command by facilitating personnel coordination and joint policy alignment.
- Contributed to the expansion of the C5-led Cultural Immersion Program for U.S. and UN Command personnel, enhancing cultural adaptation and bilateral engagement.

AWARDS

Best Paper Award (Oral) - HCI Korea 2024   📅 Jan 2024

The paper "A Sub-Region Approach with Conditional GANs for Memory Efficiency Enhancement" presented at the HCI Korea 2024 conference has been selected as a best paper.

Joint Service Commendation Medal - Secretary of Defense, United States Of America   📅 Apr 2022

- Awarded by General LaCamera on my Expiration Term of Service.

The Joint Service Commendation Medal (JSCM) is awarded in the name of the Secretary of Defense to members of the Armed Forces of the United States who distinguished themselves by meritorious achievement or service in a joint duty capacity. This award is intended for senior service on a joint military staff and is senior in precedence to service-specific Commendation Medals.

국방부장관상: 국방부 - 2021 국방 공공데이터 활용 경진대회, 서비스 개발 부문 최우수   📅 Aug 2021

- Developed the model API, web restful API and front-end pages.
- Supported the development of a personalized recommendation model through a DL model using tf-idf and word2vec.

Developed a platform aimed at promoting systematic self-development for military members. With the help of artificial intelligence, our platform recommends personalized books and certifications, and provides information on pass rates for the certifications. Users can easily keep track of their self-development progress by writing personal development journals using Markdown syntax. The platform also includes a ranking system that encourages healthy competition among users by awarding points.

최우수상: Mantech - 제 2 회 오픈 인프라 개발 경진대회 (OIDC 2020)   📅 Aug 2020

- Developed all the features below including APIs and the model

Developed a platform that utilizes the Seoul Open API to periodically collect realtime data on the inventory of public rental bikes (Ddareungi). The platform predicts future inventory using an LSTM model, in order to improve the convenience of Ddareungi users.

특별상: 과학기술정보통신부, 국회도서관 - 제 2 회 개방형 클라우드 플랫폼 서비스 개발 해커톤   📅 Dec 2019

- Developed all the features below including APIs and the model

Developed a location-based platform for sharing real-time information on missing pets, allowing users to check the current status of missing pets. It enables users to share the location where a missing pet was last seen or where a missing pet was found recently.

PATENTS

- **System and method for automatic creating region of interest based on deep learning for machine vision**
  (머신비젼을 위한 딥러닝 기반 관심영역 자동생성 시스템 및 방법)
  Patent No. 10-2024-0153587 - 우선심사 진행중
  K. Han, Y. Chang, K. Lee
  Nov 2024

PUBLICATIONS AND PRESENTATIONS

Journal

- **MAGICal Synthesis: Memory-Efficient Approach for Generative Semiconductor Package Image Construction**
  Yunbin Chang, Wonyong Choi, Keejun Han*,
  Journal of the Microelectronics and Packaging Society, 2023.

Conferences
- **A Sub-Region Approach with Conditional GANs for Memory Efficiency Enhancement**
  Yunbin Chang, Wonyong Choi, Keejun Han*,
  HCI 2024, 2024.

- **A Computationally Optimized Data Augmentation Framework Utilizing cDCGAN for High-Resolution Package Images Acquisition**
  Yunbin Chang, Wonyong Choi, Keejun Han*,
  21st International Symposium on Microelectronics and Packaging (ISMP 2023), 2023.

RESEARCH PROJECTS

📅 Jan 2025 – Present   *Researcher, Deepseers*

Project: "*Next-generation semiconductor package defect detection system with minimal user intervention*"
(사용자 개입이 최소화된 차세대 반도체 패키지 불량 검출 시스템)

중소벤처기업부(TIPS)

📅 Oct 2024 – Dec2024   *Researcher, Deepseers*

Project: "*Next-generation semiconductor package defect detection system with minimal user intervention*"
(사용자 개입이 최소화된 차세대 반도체 패키지 불량 검출 시스템)

중소벤처기업부(TIPS)

📅 May 2023 – Dec2024   *Researcher, AML Lab. Hansung University*

Project: "*Development of AI based smart manufacturing process and equipment technology to strengthen the competitiveness of semiconductor materials parts and equipment*"
(반도체 소자 생산을 위한 인공지능 기반 스마트 제조 공정 장비 및 관련 기술 개발)

산업통상자원부

CERTIFICATIONS

- Nov 2017 **Linux Master II**
  Korean Association for ICT Promotion

- Feb 2019 **Driver's License Class 2**
  Commissioner of Seoul Metropolitan Police Agency

LANGUAGES

- Korean – Native
- English – Intermediate (TOEIC 845)