Minhyeok Bae



Manufacturing automation engineer · Semiconductor inspection

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I build inspection recipes from layout data, tune mark detection with labeled field images and use a local language model to automate engineering reports.

Experience

Software engineer, associate grade · Semiconductor inspection R&D Jan 2022 – present

Work-study hire. Supported production lines at two Korean memory manufacturers. By H1 2026, I had worked on **7+ tool types**, completed **80 tasks** and written **8 customer documents**.

2022–2024 · Inspection displays, defect statistics, coordinate matching and 2D/3D inspection tool setup.

Selected projects

Layout-driven inspection recipe generation (RAC) 2026

Bump recipe creation fell from **4 h to 20 min**. Large-area layout conversion fell from **314 to 42 s**.

Corrected layout coordinates to place about 250,000 bumps and processed only the required tiles in parallel. Conversion passed production-material tests. The cross-site tool awaits deployment.

Training and validation for Shot Key detection 2026

Rules and fewer scan lines cut field alignment from **140 to 23 s**, with marks in **12/12** slots. CNN false detections fell from **280 to 114** on 6,150 in-house images including augmented examples.

Found same-day leakage and introduced a fixed date-based evaluation split and regression checks. Rules passed field tests. The CNN runs in shadow alongside the existing decision.

Weekly engineering reports with a local LLM 2026

In a two-week synthetic replay of the public app, inputs through the export request fell from **25 to 16**.

Grouped commits by topic, drafted slides and checked numbers and status claims against the input. The internal tool had 10 team users. One weekly run produced a report from 5 manually entered topics.

Skills

Python, NumPy, PyTorch, ONNX, local LLMs, C# (WPF), C++ and OpenCV. GDS conversion, recipe generation and model evaluation.

Education and research

Inha University, Graduate School of Manufacturing Innovation · M.S. in Semiconductor Process Intelligence Convergence, part-time. Mar 2026 – Feb 2028 (expected).

Research on inspection zones and settings from layout data. On public SKY130 layouts and synthetic images, critical-defect detection rose from **81.3% to 95.3%** at ≤1 false call per image.

Tech University of Korea · B.S. in Computer and Electronic Engineering, work-study, Mar 2022 – Feb 2026. GPA 3.9/4.5, merit scholarship.

Seoul Robotics High School · Meister high school, Mar 2019 – Feb 2022.

Certifications and training

Work-Study Qualification in SW Development L5 (Dec 2025), ADsP data analytics (Sep 2025), national certifications in electronics, electricity and programming.

Eight major semiconductor fabrication processes (2022) and applied LLM training (2025).