Minhyeok Bae



Equipment control software engineer · Semiconductor tools

mhbae03@gmail.com github.com/mhbae-semi-lab mhbae-semi-lab.github.io/portfolio

I integrate cameras, data acquisition and motion axes in imaging and contact-sensing sequences. On a new tool, I spent 25 days on site tracing and fixing software freezes.

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

Stabilizing a new particle-removal tool 2025–2026

Recorded **0 failures** in 11 days (264 h). Vision uptime was **98.86%**, including 3 h of planned downtime.

Kept the newest frame for display and added camera reconnection and exit detection. Spent 25 days on site reproducing and fixing freezes. The tool is in production and has passed third-party certification.

Motion interlock for tip protection 2026

Recorded **0 repeat tip breakages** after rollout. Production lots ran normally.

Checked clearance from Z position and enabled XY travel only after Z rose and stopped. A separate 1,000-cycle lifter test checked stop-position repeatability (3σ) at home and limit switches.

Particle-height measurement by contact sensing 2025

Image autofocus fell from **90 to 25 s**. Contact sensing gave **±2 µm** repeatability over 20 measurements on particles ≥300 µm.

Used voltage thresholds to detect the floor and particle top on low-texture surfaces. Verified consecutive and multiple shears on production material in the field.

Skills

C# (WinForms and WPF), C++, multithreading, asynchronous processing, DAQ, motion sequences and interlocks. TDI line-scan and area cameras, 3D confocal sensors.

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).