DONGHYEUN LEE

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SUMMARY

Detail-driven Full Stack Developer transitioning to AI engineering with 4+ years of experience in scalable system development. Proven expertise in Python, React, and Node.js with a track record of integrating AI/ML solutions in complex projects. Skilled in transforming research into practical tools and building end-to-end applications, excited to leverage technical versatility and innovative problem-solving in an AI-powered product environment.

EDUCATION

University of Texas at Austin **Jun 2024 - Mar 2025**
Post Graduate Program, Artificial Intelligence & Machine Learning

HiMedia Academy **Oct 2024**
Bootcamp, AI and Full Stack Development in Java

Sogang University **Feb 2020**
Masters, Chemistry

SUNY Buffalo State University **Jun 2018**
Masters of Science, Biomedical Engineering

Hong Kong University of Science and Technology **May 2013**
Bachelors of Science, Chemical and Bioproduct Engineering

WORK EXPERIENCE

Proteina Inc. **Jul 2021 - Feb 2024**
Production and Process Development Senior Researcher *Seoul, South Korea*

Operated in a biotechnology setting focused on advancing innovative protein-based products and solutions for healthcare, agriculture, and industrial applications.

- Optimized thin film deposition, biochemical functionalization, and anti-fouling processes for microarray chip production, enhancing manufacturing efficiency.
- Directed the design and testing of microarray chip assembly processes, including jet dispensing and non-destructive quality control for 96/384 well platforms.
- Engineered Python-based analysis tools for ELISA, quality control, and manufacturing big data, developing modules for shelf life prediction, LoD/validation automation, and signal normalization (PEG correction), reflecting full-stack development capabilities.
- Supported pharmaceutical drug assessment, multiplex assay optimization, and maintained documentation for ISO compliance and regulatory inspections.

Palogen LLC **Aug 2020 - Jul 2021**
Research And Development Engineer *Seoul, South Korea*

Operated in a biotechnology company developing nanoelectronic sensor platforms for advanced diagnostics and life sciences.

- Designed and implemented defect characterization methodologies for nanopore wafer chips using Python data analysis, demonstrating a strong problem-solving mindset.
- Established quality control protocols for microarray chip manufacturing and nanopore conjugation processes.
- Contributed to ISO13485 compliance, prepared IRB documentation for clinical testing of COVID microarray diagnostics, and supported clinical studies.

PROJECTS

AI-Powered PDF Extractor Desktop App **2025**
Personal Project *Austin, TX*

- Built a cross-platform Tauri desktop app to extract tables and text from PDFs using OpenCV-detected zones and hybrid OCR
- Developed a preview interface for selecting ROIs, toggling between manual and auto modes
- Enabled voice-to-text transcription, AI-based keyword labeling, and ChatGPT-powered response assistant
- Stored user feedback, extraction results, and performance logs in a MySQL database to improve future accuracy

AI-Powered "Lonely Death" Prevention Web App **Oct 2024**
Donguk University *Seoul, South Korea*

- Developed a dynamic AI-powered web application using React.js, integrating AI technologies, data processing, and web frameworks for an intuitive user experience
- Implemented a robust user authentication system with JWT tokens, password hashing, email verification (via Flask-Mail), and MySQL for secure account handling
- Integrated AI emotion recognition models (RAVDESS and FER) to analyze emotions from images and audio
- Visualized data trends using Matplotlib and Seaborn, and exported audio analysis reports in CSV format

Inventory Book Management System Term Project **Jun 2024**

HiMedia Academy *Seoul, South Korea*

- Designed and implemented calendar-based CRUD features to summarize and track inventory orders and memos
- Built backend logic using Spring Boot in an MVC architecture for scalable data handling
- Developed secure API endpoints with role-based access control and optimized database indexing

Commercialization Support Project **2023 - 2024**

KTL, KRISS, and Nano Convergence Technology Institute Collaboration

- Participated in technology commercialization initiatives focused on nano-diagnostics and microarray platforms
- Contributed to product transfer and regulatory certification, including development of non-invasive QC for nano-pore microarrays and TIRF-based iELISA
- Led cross-institutional collaboration in the Precision Medicine Technology Commercialization Project with GC Biopharma and national institutes

KEY SKILLS

- **Languages**: Python, Java, JavaScript, SQL
- **Frameworks**: React.js, Flask, Spring Boot, MyBatis, FastAPI
- **Databases**: MySQL, PostgreSQL, MongoDB
- **Cloud/DevOps**: Docker, AWS basics
- **Tools**: Git, VS Code, Eclipse
- **AI & Full Stack**: AI applications, Full-stack development, AI APIs

CERTIFICATES

- IBM – Advanced Machine Learning and Signal Processing
  Credential ID: MSF6W4FE9RS6 • Issued: Jun 2024 • Expires: Jun 2034
- DeepLearning.AI – Introduction to TensorFlow for AI, ML, and DL
  Issued: May 2024 • Expires: May 2034
- DeepLearning.AI – Convolutional Neural Networks in TensorFlow
  Issued: May 2024 • Expires: May 2034
- IBM – Data Analysis with Python
  Credential ID: 8TAA6DNWHWM9 • Issued: May 2024 • Expires: May 2034
- IBM – Databases and SQL for Data Science with Python (
  Credential ID: VQ7B2QDEQVX2 • Issued: May 2024
- IBM – Python for Data Science, AI & Development
  Credential ID: VK283D2LM9U9 • Issued: May 2024 • Expires: May 2034

PUBLICATION

- Y.T.; Oh, H.; Seo, M.J.; Lee, D.H.; Shin, J.; Bong, S.; Heo, S.; Hapsari, N.D.; Jo, K.. 21 Fluorescent Protein-Based DNA Staining Dyes. Molecules 2022, 27, 5248. https://doi.org/10.3390/molecules27165248
- Wang, D., Lee, D. H., Huang, H., Vu, T., Lim, R., Nyayapathi, N., ... Lovell, J. F.. Ingestible roasted barley for contrast-enhanced photoacoustic imaging in animal and human subjects. Biomaterials, 175, 72–81. doi:10.1016/j.biomaterials.2018.05.016