SUNGHEE YUN

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Profile

I am Co-founder & CTO of AI Technology and Product Strategy @ Erudio Bio, Inc. with expertise in Artificial Intelligence (AI) and Product and Technology Strategy. I have led AI and optimization projects in the fields such as semiconductor design / manufacturing / testing, strategic marketing and sales, e-commerce, industrial AI, and AI-enhanced biotech based on my fundamental understanding of the inner workings of and insight into AI with knowledge on convex optimization underpinning all AI algorithms.

My strength lies in applying core AI technologies such as large language model (LLM) and generative AI (genAI) for development and productionization of a number of software and services to many customers for B2B and B2C business. I am also consulted for state and government policy-making with topics such as potential changes of labor market driven by of AI technology, ethical, social and political issues on AI, and supply chain and manufacturing of AI semiconductor chips including CPU, GPU, and AI accelerators.

Before joining Erudio Bio, Inc., I co-founded Gauss Labs Inc., an industrial AI start-up company, as CTO & Head of Global R&D. I led many high-profile AI projects at Amazon increasing revenue by 200 million USD via Amazon Mobile Shopping App. Prior to Amazon, I worked for Samsung Electronics leading AI and optimization projects for semiconductor design, manufacturing, and testing.

Work and Research Experience

Co-founder & CTO - AI Technology & Product Strategy, Erudio Bio, Inc.   Dec-2023 – Present

- AI Technology, and Product Strategy to develop and productionize AI-enhanced multiplomic multiplexing bio data platform

Adjunct Professor, Electronic Engineering Department, Sogang University   Mar-2020 – Present

Advisory Professor, Information and Communication Engineering, DGIST   Feb-2020 – Present

- Consultation on academic direction, industry trend in Silicon Valley, social scientific / ethical / legal issues of AI & special lectures and seminars

Network Expert, Gerson Lehrman Gruop (GLG), New York City, U.S.A.   Feb-2022 – Present

- Help clients solve their toughest business and technical challenges around manufacturing profit and sales improvement, e-commerce customer engagement level improvement, and AI technology in biotech industry

Co-founder & CTO - Senior Fellow, Gauss Labs Inc., Palo Alto, CA. U.S.A   May-2000 – Nov-2023

VP - Fellow, SK hynix   Sep-2020 – Jun-2021

- Business, Product & Tech Development / Operate US Headquarters

Senior Applied Scientist, Amazon.com, Inc., Vancouver, BC, Canada   Nov-2018 – Aug-2020

- AI for Mobile Shopping App Main Menu Personalization system creating revenue by 200MM USD
- TestBot AI agents patching and updating software test scenarios

Principal Engineer, Software R&D Center, Samsung Electronics   Dec-2016 – Jun-2017

- Decentralized Federated AI for Internet of Things (IoT)

Principal Engineer, Strategic Sales & Marketing Team, Samsung Electronics   Dec-2015 – Dec-2016

- AI for Sales Forecasting of world-wide NAND Flash and DRAM markets

Principal Engineer, Design Technology Team, Samsung Electronics   Mar-2012 – Nov-2015

- AI for Optimal Scheduling System for Test & Package Factories in Suzhou, China,

- Generic AI & Optimization Platform for automatization of semiconductor design & manufacturing

Senior Engineer, CAE Team, Semiconductor R&D Center, Samsung Electronics   Dec-2004 – Feb-2012

- NAND Flash Memory Core Operation Optimization achieving 10% accuracy improvement
- Generic Digital/Analog/Mixed-signal Circuit Optimization
- High density DRAM failure rate estimation achieving > 100X prediction time reduction

Research Assistant, EE Department, Stanford University, CA, U.S.A.   Mar-1999 – Nov-2004

- Multi-objective Logic Circuits Design using Convex Optimization

Development Engineer, Voyan Technology, Santa Clara, CA, U.S.A.   Sep-2000 – Aug-2001

- Digital Subscriber Line (DSL) Diagnosis & Length Adjustable Transmission Line Emulator

EDUCATION

Ph.D., Electrical Engineering - Advisor: Prof. Stephen Boyd Stanford University, CA, U.S.A.	Sep-2001 – Nov-2004
M.S., Electrical Engineering - Advisor: Prof. Stephen Boyd Stanford University, CA, U.S.A.	Sep-1998 – Jun-2000
B.S., Electrical Engineering - Magna Cum Laude Seoul National University, Seoul, Korea	Mar-1994 – Feb-1998

HONORS AND AWARDS

• Best Invention Award at Amazon.com, Inc.	2019
• Best Paper Award at Samsung Semiconductor Technical Paper Award	2011
• Best Paper Award at Samsung Group Best Paper Award	2005
• Best Paper Award at International Symposium on Quality Electronic Design (ISQED)	2005
• Full Scholarship from Samsung Electronics	2001–2004
• Samsung Frontier Membership	1999
• Ranked 2nd in the Ph.D. Qualifying Examination, Stanford University	1999
• Full Scholarship from Korean Foundation for Advanced Study (KFAS)	1998–2000
• Graduated with Honors - Magna Cum Laude, Seoul National University (SNU)	1998
• Full Scholarship from Seoul National University (SNU)	1994–1998
• Ranked 2nd in University Entrance Examination, Seoul National University (SNU)	1994
• Graduated with Honors - Summa Cum Laude, Seoul Science High School	1993
• Bronze Medal at Asian Pacific Mathematical Olympiad (APMO)	1992
• Silver Medal at Korea Mathematical Olympiad (KMO)	1992

INVITED SEMINARS AND LECTURES

- "SAIT AIRC Seminar: LLM & getnAI - Technology, Business, and AI Markets" invited by Samsung Advanced Institute of Technology (SAIT)   2024
- "DGIST Seminar: LLM & getnAI - Technology, Business, and AI Markets" invited by EE Department of Daegu Gyeongbuk Institute of Science and Technology (DGIST)   2024
- "Cryptography Seminar: Industrial AI Technology in Manufacturing" - SNU Math Department   2024
- "SNU Data Science (DS) Seminar: Industrial AI Technology" - SNU DS Graduate School   2023
- "EE/CS Seminar: Manufacturing AI Problems and Solutions" invited by SNU   2022

- "BK4 Seminar: Manufacturing AI Problems and Solutions" invited by Sogang University   2022
- "Time-series Machine Learning in Manufacturing" invited by Postech   2022
- "Time-series Learning and Software Platform for Manufacturing AI" invited by DGIST   2022
- "AI Frontier Summit: AI in Manufacturing and Industry Areas" invited by KICS   2021
- "Special Lecture: Electrical Engineer in the age of AI" invited by Sogang University   2021
- "Future Creation Seminar: The Future of AI" invited by Amore Pacific   2020
- "Reinforcement Learning and its Applications" invited by School of Business of UBC   2018
- "Convex Optimization for Machine Learning (ML)" invited by SNU   2018
- "Convex Optimization for Artificial Intelligence (AI)" invited by Amazon ML Meetings   2018
- "KCC Tutorial: Convex Optimization for Decentralized Machine Learning" invited by KCC 2017   2017
- "Convex Optimization for Machine Learning" invited by Samsung DRAM Development Lab   2017
- "Introduction to Convex Optimization and its Applications" invited by Kyung Hee University   2013
- "Convex Optimization and its Applications" invited by SNU   2008
- "Circuit Design via Geometric Programming" invited by SNU   2005
- "Convex Optimization and its Application in Circuit Design" invited by Samsung Electronics   2002

SELECTED PUBLICATIONS

- Sangyoun Lee, Juho Jung, Changdae Oh, and Sunghee Yun. "Enhancing Temporal Action Localization: Advanced S6 Modeling with Recurrent Mechanism", https://arxiv.org/abs/2407.13078, 2024

- S. Zabrocki, P. Jo, C. Park, D. Yim, S. Yun, and B. Lee. "Adaptive Online Time-Series Prediction for Virtual Metrology in Semiconductor Manufacturing", 34th Annual SEMI Advanced Semiconductor Manufacturing Conference (ASMC), May 2023

- M. Karpusha, S. Yun, and I. Fehervari. "Calibrated neighborhood aware confidence measure for deep metric learning", (https://arxiv.org/abs/2006.04935), June 2020

- J. Lee, S. Yun, J. Kim, D. Kang, J. Kim, and S. Lee. "Multiple shift-vector importance sampling method using support vector machine and clustering for high-density DRAM designs", 17th International Symposium on Quality Electronic Design (ISQED), pp. 430–436, March 2016

- J. Jeon, I.H. Park, M. Kang, W. Hahn, K. Choi, S. Yun, G. Yang, K. Lee, Y. Park, and C. Chung. "Accurate compact modeling for sub-20-nm NAND Flash cell array simulation using the PSP model", IEEE Transactions on Electron Devices, Vol. 59, No. 12, pp. 3503–3509, December 2012

- S. Yun, I.H. Park, N.H. Lee, and J.K. Jeong. "New design methodology for efficient NAND Flash development using multiobjective evolutionary algorithm", Samsung Semiconductor Technical Paper Award, August 2011 (Best Paper Award)

- S.-J. Kim, S. Boyd, S. Yun, D. Patil, and M. Horowitz. "A heuristic for optimizing stochastic activity networks with applications to statistical digital circuit sizing", Optimization and Engineering, Vol. 8, No. 4, pp. 397–430, December 2007

- S. Yun, D.H. Kim, and S.H. Jung. "Statistical parameter estimation methodology for statistical circuit analysis", Samsung Group Paper Award, November 2005 (Best Paper Award)

- D. Patil, S. Yun, S.-J. Kim, A. Cheung, M. Horowitz, and S. Boyd. "A new method for design of robust digital circuits", 6th International Symposium on Quality Electronic Design (ISQED), San Jose, pp. 676–681, March 2005 (Best Paper Award)

- S. Boyd, L. Vandenberghe, A. El Gamal, and S. Yun. "Design of robust global power and ground networks", Proceedings ACM/SIGDA Symposium on Physical Design (ISPD), pp. 60–65, April 2001

PATENTS

- Systems and Methods for Process Monitoring and Control   2023

- Testbot AI agent: automatic software test scenario patch and modification system 2020
- Method of testing semiconductor memory device, test device, and computer readable recording medium for recording test program for semiconductor memory device 2017
- Method and system for designing 3D semiconductor package 2014
- Methodology for estimating statistical distribution characteristics of physical parameters of semiconductor device 2009
- Methodology for estimating statistical distribution characteristics of product parameters 2007
- Length adjustable transmission line emulators with simple RLC circuits 2001

Teaching Experience

Amazon Lecturer Machine Learning University, Amazon 2018–2020
- AI Mathematical Fundamentals, AI Data Science, Advanced Machine Learning Courses

Samsung Electronics Lecturer Samsung Electronics 2005–2017
- Convex Optimization for AI, Machine Learning & AI
- Numerical Linear Algebra for ML, Advanced Statistics

Teaching Assistant Stanford University 1999–2002
- Linear Dynamical Systems, Convex Optimization