

# **Electrical Engineer in the age of Artificial Intelligence: Semiconductor, Software, and Algorithms**

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Adjunct Professor @ Sogang University / Advisory Professor @ DGIST**

## What will be covered today

- Introduction to myself
- Introduction to Gauss Labs
- AI for Semiconductor Manufacturing
  
- Dreams to dream as Electrical Engineer
- Difference between companies in Korea and companies in US
- Humble advice for students who want to work in Silicon Valley
- Lives in Korea, Canada, and USA
  
- What would I do if I could go back to fresh year of college?
- Q&A

## Introduction to myself

- Head of R&D & CTO of Gauss Labs and VP - Fellow of SK hynix (currently)
- Senior Applied Scientist @ Amazon
- Principle Engineer @ Software Research Center, Samsung Electronics
- Principle Engineer @ Strategic Sales and Marketing Team - Samsung Electronics
- Principle Engineer @ DRAM Development Laboratory
- MS and Ph.D. @ Stanford University
- BS @ Seoul National University

## Introduction to Gauss Labs

- industry (manufacturing) AI company with strong R&D
- apply AI techniques to reduce cost, improve throughput, and reduce production time
- attracts great AI/ML scientists, software engineers, program managers!



# Gauss Labs

- Vision: make it smarter than people
- aiming for the best industry AI company in the world!

**GAUSS LABS** About Us Gaussian Principles Join Us

**Sunghee Yun**  
manufacturing, marketing and sales, and retail shopping business. Before joining Gauss Labs, Sunghee led several high-profile machine learning (ML) projects at Amazon.com using deep reinforcement learning, recommender system, and anomaly detection where one of his project increased the sales by \$200 million at Amazon mobile shopping app. Prior to Amazon, he worked as a Principle Engineer for Samsung Electronics leading artificial intelligence (AI) and ML projects for reducing cost and improving performance for circuit design and manufacturing process. Currently more than 200 semiconductor designers and test engineers use the AI platform Sunghee developed everyday. He received MS and Ph.D. degrees from Electrical Engineering Department at Stanford University and BS degree from Seoul National University.

**Board of Directors**

**Kyo Won Jin** is Chief Production and Product Officer of SK Hynix overseeing the development and manufacturing of DRAM and NAND flash memory devices. Kyo Won has been working in semiconductor memory industry with several leadership roles over the past 35 years since he joined SK Hynix in 1985. He served as Executive VP of DRAM Development & Business from 2018 to 2019, and as Executive VP of Quality & Reliability Assurance from 2016 to 2018. He served as Senior VP of NAND Development & Business from 2014 to 2016. In the early 2000s, he led engineering teams developing experimental 150nm products, which helped drive SK Hynix's growth into one of the largest memory makers in the world. In 2020, he was awarded the Golden Industrial Medal by the President of Korea in recognition of his contributions to the nation's semiconductor industry. He received his B.S degree in Physics from Seoul National University.

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## SK hynix Invests in AI Specialized Company 'Gauss Labs Inc.' to Lead SK's Future Value Creation

September 22, 2020

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**Seoul, September 22, 2020**

SK hynix Inc. (www.skhynix.com) announced that Gauss Labs Inc. (www.gauss-labs.com) was founded to lead manufacturing innovation through industrial AI solutions.

Gauss Labs will start its Korean office later this month right after having established its headquarters in Silicon Valley, U.S. last month. SK hynix is the sole investor of its initial capital of \$55 million through 2022.

SK Group has been promoting various types of AI businesses with its affiliates. "We should utilize innovative technologies such as AI and digital transformation (DT) to create social value, expand our market, and help our customers pursue happiness," said Mr. Tae-won Chey, the Chairman of SK Group at SK Icheon Forum in August last year. "If we fail to utilize innovative technologies, we cannot guarantee the future of SK." Gauss Labs is the first independent corporation from SK Group specializing in AI.

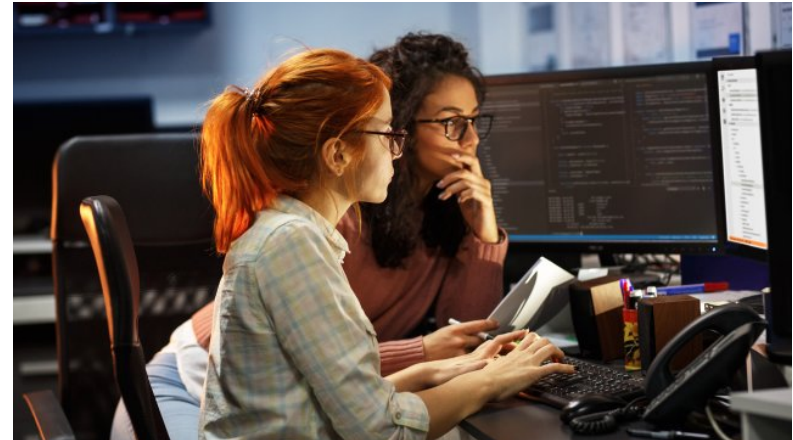
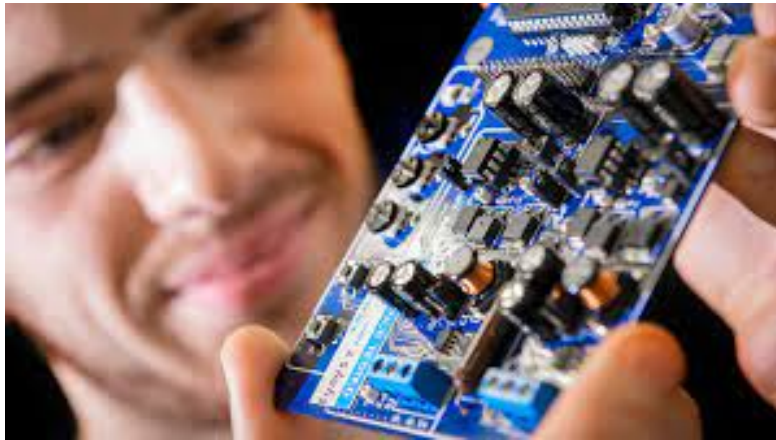
## AI for Semiconductor Manufacturing

- vision: make it smarter than people
- aiming for the best industry AI company in the world!



## Dreams to dream as Electrical Engineer

- subjects: communication, semiconductor device, circuit design, computer science/engr., software development
- related topics: optimization, numerical methods, statistics, hardware, machine learning
- electrical engineer can do virtually anything!



## Difference between companies in Korea and companies in US

- company/corporate culture, competition
- technical competence, career growth
- flexibility of labor market





## Humble advice for students who want to work in Silicon Valley

- your technical skill set is who you are and how much you get paid
- but there are universal rules by which you get along with people
- never afraid to talk about money; your value is determined by salary in job market
- *you will GROW a lot (as much as you suffer)!*



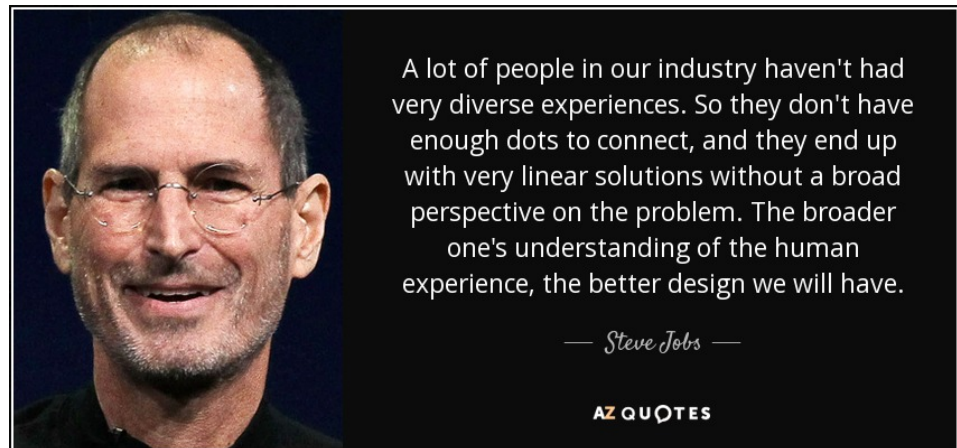
## Lives in Korea, Canada, and USA

- Korea: competitive, diligent people, best memory makers
- USA: competitive (in a different way), many diligent people
- Canada: not very competitive, not very diligent, respect many values, great social security system



## What would I do if I could go back to fresh year of college?

- First, I would NOT! because
  - (philosophical reasoning) I would've lived the same (or similar) way
- But if I did, I would
  - live a richer life by having diverse experience
  - try to think deeply, stay in the zone for longer
  - never regret my past in any circumstances



## Q&A

- Q) Should I go to graduate school?
- Q) Should I go abroad for advanced degrees?
- Q) Should I improve software development skills?
- Q) Should everyone study ML/AI?