

[K-PAI 2026 New Year Party]
Holistic Synthesis - The AI Landscape via K-PAI's Lenses

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Co-Founder & CEO @ Erudio Bio Korea, Inc.

Leader of Silicon Valley Privacy-Preserving AI Forum (K-PAI)

CGO / Global Managing Partner @ LULUMEDIC

Global Leadership Initiative Fellow @ Salzburg Global Seminar

Visiting Professor & Advisory Professor @ Sogang Univ. & DGIST

About Speaker

- *Co-Founder & CTO @ Erudio Bio, Inc., San Jose & Novato, CA, USA* 2023 ~
- *Co-Founder & CEO @ Erudio Bio Korea, Inc., Korea* 2025 ~
- *Leader of Silicon Valley Privacy-Preserving AI Forum (K-PAI), CA, USA* 2024 ~
- *CGO / Global Managing Partner @ LULUMEDIC, Seoul, Korea* 2025 ~
- *KFAS-Salzburg Global Leadership Fellow @ Salzburg Global Seminar, Austria* 2024 ~
- *Adjunct Professor, EE Department @ Sogang University, Seoul, Korea* 2020 ~
- *Advisory Professor, EECS Department @ DGIST, Korea* 2020 ~
- *AI-Korean Medicine Integration Initiative Task Force Member @ The Association of Korean Medicine, Seoul, Korea* 2025 ~
- *Director of AI Semiconductor @ K-BioX, CA, USA* 2025 ~
- Global Advisory Board Member @ Innovative Future Brain-Inspired Intelligence System Semiconductor of Sogang University, Korea 2020 ~
- Technology Consultant @ Gerson Lehrman Group (GLG), NY, USA 2022 ~
- Chief Business Development Officer @ WeStory.ai, Cupertino, CA, USA 2025 ~
- Advisor @ CryptoLab, Inc., Seoul, Korea 2025 ~

- Co-Founder & CTO / Head of Global R&D / Chief Applied Scientist / Senior Fellow @ Gauss Labs, Inc., Palo Alto, CA, USA 2020 ~ 2023
- Senior Applied Scientist @ Amazon.com, Inc., Vancouver, BC, Canada 2017 ~ 2020
- Principal Engineer @ Software R&D Center, Samsung Electronics 2016 ~ 2017
- Principal Engineer @ Strategic Marketing & Sales, Memory Business 2015 ~ 2016
- Principal Engineer @ DT Team, DRAM Development, Samsung 2012 ~ 2015
- Senior Engineer @ CAE Team, Memory Business, Samsung, Korea 2005 ~ 2012
- PhD - Electrical Engineering @ Stanford University, CA, USA 2001 ~ 2004
- Development Engineer @ Voyan, Santa Clara, CA, USA 2000 ~ 2001
- MS - Electrical Engineering @ Stanford University, CA, USA 1998 ~ 1999
- BS - Electrical & Computer Engineering @ Seoul National University 1994 ~ 1998

Highlight of Career Journey

- BS in Electrical Engineering (EE) @ Seoul National University
- MS & PhD in Electronics Engineering (EE) @ Stanford University
 - *Convex Optimization - Theory, Algorithms & Software*
 - advisor - *Prof. Stephen P. Boyd*
- Principal Engineer @ Samsung Semiconductor, Inc.
 - *AI & Convex Optimization*
 - collaboration with *DRAM/NAND Design/Manufacturing/Test Teams*
- Senior Applied Scientist @ Amazon.com, Inc.
 - *e-Commerce AIs* - anomaly detection, deep RL, and recommender system
 - *Jeff Bezos's project* - drove \$200M in sales via Amazon Mobile Shopping App
- *Co-Founder & CTO / Global R&D Head & Chief Applied Scientist* @ Gauss Labs, Inc.
- *Co-Founder & CTO* @ Erudio Bio, Inc.
- *Co-Founder & CEO* @ Erudio Bio Korea, Inc.

Unpacking AI

- K-PAI's Journey - 5
 - 13 forums mapping the whole AI universe
 - from security to humanity to infrastructure
- Differentiated Unique Insights ONLY K-PAI's could possibly provide! - 10
 - complete full-stack AI
 - international cooperation as strategic model
 - bio/medical AI revolution
 - infrastructure reality check
 - maturation from education to strategic discourse
- Call for Volunteers - 19
 - Volunteers will be blessed!
- Selected references - 21

K-PAI's Journey

K-PAI's Journey - 13 Forums mapping the Whole AI Universe

- *November 2024 - The Foundation* - homomorphic cryptography
 - Forum 1 (06-Nov): The AI Strikes Back - A New Hope in Cryptography @ Alaska
 - Forum 2 (20-Nov): Free Your Data - HE Revolution in Private AI @ Alaska



K-PAI's Journey - 13 Forums mapping the Whole AI Universe

- *Q1 2025 - Technology Deep Dive* @ Stanford University
 - Forum 3 (22-Jan): The AI Knight Rises - From Deep Learning to Flourishing Societies
 - Forum 4 (12-Feb): Silicon Citadel - Forging AI's Data Kingdoms on Iron & Sand



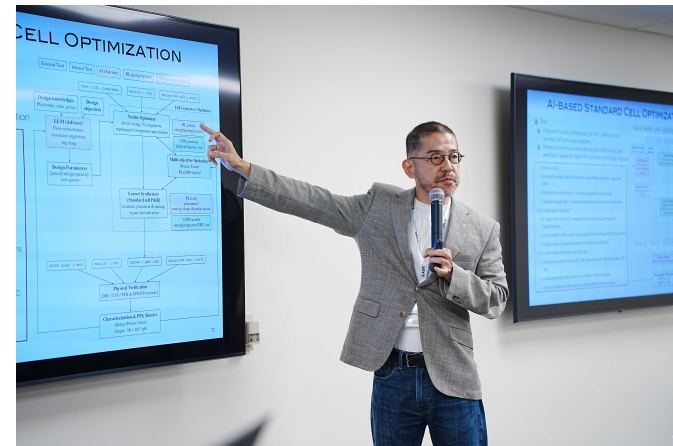
K-PAI's Journey - 13 Forums mapping the Whole AI Universe

- *Q2 2025 - Emerging Technologies & Applications* @ LG Elec., SK hynix, KOTRA & Altos
 - Forum 5 (12-Mar): Blockchain Awakens - The Force of Decentralized AI
 - Forum 6 (22-Apr): Advancing Humanity - Bio and Medical Technology's AI Revolution
 - Forum 7 (21-May): The Autonomous Alliance - AI Agents in a Connected World
 - Forum 8 (18-Jun): Silicon Companions - Robots and Smart Devices in Daily Life



K-PAI's Journey - from Security to Humanity to Infrastructure

- *Q3 2025 - Security & Humanity* @ Stanford University & KIC
 - Forum 9 (16-Jul): Fortress Code - The New Frontier of AI Security
 - Forum 10 (20-Aug): The Human-Centric AI Revolution - From Technical Compliance to Humanistic Leadership
- *Q4 2025 - Infrastructure & Market* @ KOTRA & K●ASIC
 - Forum 11 (29-Sep): Power Paradigm - AI-Driven Solutions for Energy's Future
 - Forum 12 (08-Oct): Ad Intelligence - AI Revolution in Digital Marketing
 - Forum 13 (12-Nov): The AI Silicon Race - Korea-US Innovation Leadership



**Differentiated Unique Insights ONLY
K-PAI's could possibly provide!**

Complete full-stack AI - understanding through narrative arcs

- *layer 1 - applications & use cases*
 - Forum 12 - marketing AI - video targeting, programmatic advertising
 - Forum 6 - bio/medical AI - genomics analysis, medical imaging, precision medicine
 - what AI actually does for end users
- *layer 2 - AI agents & orchestration*
 - Forum 7 - AI Agents - multi-agent systems, MCP, tool usage, agentic workflows
 - how AI systems coordinate, delegate tasks, and interact with tools/data

Complete full-stack AI - understanding through narrative arcs

- *layer 3 - models & algorithms*
 - Forum 3 - holistic AI landscape - DL → Transformer → LLM, genAI → agentic AI
 - Forum 11 - energy discussion - architectural alternatives (*e.g.*, Liquid Neural Networks)
 - how AI learns and processes information
- *layer 4 - software infrastructure*
 - Forum 7 - AI Agents - Development frameworks, RAG systems, agent protocols
 - Forum 5 - blockchain/AI - decentralized infrastructure, privacy-preserving computation
 - middleware and platforms that connect algorithms to hardware
- *layer 5 - hardware & silicon*
 - Forum 13 - semiconductors - NPU, chip design, inference accelerators
 - Forum 7 - from SK hynix - memory systems, HBM, computational requirements
 - physical compute substrate

Complete full-stack AI - understanding through narrative arcs

- *layer 6 - energy & power infrastructure*
 - Forum 11 - power paradigm - renewable energy, grid modernization, datacenter power
 - what makes the hardware run
- *layer 7 - security & privacy*
 - Forum 9 - fortress code - AI-powered security, adversarial ML, zero-trust architectures
 - Forum 1, 2 - homomorphic encryption - privacy-preserving AI
 - Forum 6 - bio/medical - healthcare data security, federated learning
 - what protects the entire stack

International cooperation as strategic model

- Korea + US - complementary strengths
 - manufacturing excellence, process technology, scale production
 - architecture innovation, design tools, systems integration
- K-PAI's multi-layer partnership model
 - community partnerships - *K-PAI × KOTRA × K•ASIC × K-BioX*
 - industry collaborations - *K-PAI × SK hynix × LG electronics*
 - academic exchanges - *K-PAI × SNU College of Engineering × KAIST × KUBS*
- Why This Matters
 - non-zero-sum cooperation in era of tech nationalism
 - bridges that survive government policy shifts
 - *grassroots communities creating institutional impacts*

Bio/medical AI revolution - advancing Humanity through AI-powered Healthcare

- Historic Partnership
 - K-PAI × K-BioX collaboration - privacy-first AI meets biomedical innovation
 - > 100 participants - AI researchers, genomics specialists, healthcare professionals
- Precision Medicine - Dr. HoJoon Lee @ Stanford - genomics + imaging analysis
- Medical Imaging - Dr. Donghoon Kim @ Stanford - 56% faster MRI scans
- Critical Insights
 - massive biomedical data underutilized
 - multi-modal AI (genomics + imaging + EHR) = unprecedented insights



Infrastructure reality check

- Energy Crisis (Forum 11)
 - exponential compute growth hitting infrastructure limits
 - renewable deployment + grid modernization essential (not optional)
- Silicon Bottleneck (Forum 13)
 - chip architecture fundamentally constrains what's algorithmically possible
 - manufacturing capacity and supply chain vulnerabilities threaten AI scaling
- Security Substrate (Forum 9)
 - hardware-level vulnerabilities in AI systems
 - AI-powered attacks require AI-native defenses

Invisible foundation thesis

- What AI conversations focus on
 - Which model is best? (GPT-4 vs Claude vs Gemini)
 - What can AI do? (Applications and use cases)
 - How do algorithms work? (Transformers, attention mechanisms)
 - What's the business model? (API pricing, deployment strategies)
- Forum 13's Revelation - AI conversations ignores
 - intricate engineering - EDA tools, physical design, verification flows
 - massive investment - \$20B+ fabs, \$500M+ design costs
 - international collaboration - US design tools + Korean manufacturing + global materials

Maturation from education to strategic discourse

- The Evolution from Forum 3 (“AI is becoming a commodity”) to Forum 13 (geopolitical semiconductor dynamics) shows intellectual deepening
 - explaining what AI can do → examining what makes it possible
 - technical optimization → ecosystem sustainability
 - narrow specialization → systems-level comprehension
 - reactive learning → proactive discourse shaping
- Unique Insight
 - K-PAI evolved from technical education (teaching people about AI) to strategic discourse (shaping how the community thinks about AI’s role in society, economy, and geopolitics)
 - rare transition that few tech communities successfully navigate

Call for Volunteers

Volunteers will be blessed!

- who enjoys “git push”ing, “git pull”ing, “commit”ing, *etc.*?
 - you can help [Sunghee](#) maintain, manage, update, improve *our Homepage!*
- who wants to contribute to [K-PAI](#) as registered non-profit org?
 - *book keeping, tax filing, soliciting donations, etc.*
- who wants to contribute as
 - *program committee members (for each Forum)?*
 - *social media managers (LinkedIn, Instagram, X, Facebook)*



Selected References & Sources

Selected references & sources

- Robert H. Kane “Quest for Meaning: Values, Ethics, and the Modern Experience” 2013
- Michael J. Sandel “Justice: What’s the Right Thing to Do?” 2009
- Daniel Kahneman “Thinking, Fast and Slow” 2011
- Yuval Noah Harari “Sapiens: A Brief History of Humankind” 2014
- M. Shanahan “Talking About Large Language Models” 2022
- A.Y. Halevry, P. Norvig, and F. Pereira “Unreasonable Effectiveness of Data” 2009
- A. Vaswani, et al. “Attention is all you need” @ NeurIPS 2017
- S. Yin, et. al. “A Survey on Multimodal LLMs” 2023
- Chris Miller “Chip War: The Fight for the World’s Most Critical Technology” 2022
- CEOs, CTOs, CFOs, COOs, CMOs & CCOs @ startup companies in Silicon Valley
- VCs on Sand Hill Road - Palo Alto, Menlo Park, Woodside in California, USA

Thank You