
School of
Electrical Engineering
KAIST EE
KAIST EE
SCHOOL OF
ELECTRICAL
ENGINEERING
전기 및 전자공학부

Reshaping Tomorrow's Technology

KAIST EE

Vision

The School of Electrical Engineering is striving to serve as a cradle for innovative technology that will better serve the world.

Mission

The School of Electrical Engineering is committed to advancing new innovations, nurturing future thought leaders through interdisciplinary and multidisciplinary education, and conducting groundbreaking research crucial for making a significant impact on the world.

KAIST EE

Architect of Korea's IT Dominance

Strategic Collaborations

- Dynamic partnerships with government and industry

Research and Educational Innovation

- Cutting-edge research and innovative educational initiatives

Historic Breakthroughs from KAIST EE

- CDC (Charge Coupled Device) research leading to the creation of 64K DRAM by Samsung in 1975
- Development of a 2-tesla MRI system in 1985
- Creation of the 386 microprocessor and a supercomputer with 2.56 gigaflops in 1995

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EE the Largest KAIST Faculty

6 Divisions

Department of Semiconductor System Engineering

Graduate School of AI Semiconductor

Graduate School of Semiconductor Technology

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EE by the Numbers

(as of fall 2023)

Student Body

Undergraduate	950
Master Course	470
Ph. D Course	765
International Students	142
Dual Degree	1
Exchange Students	16
Total	2202

Faculty & Staff

Full Time Professors	88
International Faculty	8
Post-doc/Research Professors	39/7
Adjunct Professors	9
Emeritus Professors	44
IEEE & ACM Fellows	23
Administrative Staff	23

Startups

Faculty	12
Student	155

Patents & Technology Transfers

Patents Registered (domestic)	1,006
Patents Registered (global)	373
Technology Transfers	6.4 million USD

Research Centers & Labs

Research Centers	39
Labs	87

Publication

Avg publications per year in SCI/SSCI journals	410
20% of our publications are in the Top 10% of journals	

Research Grants

140 million USD/Year

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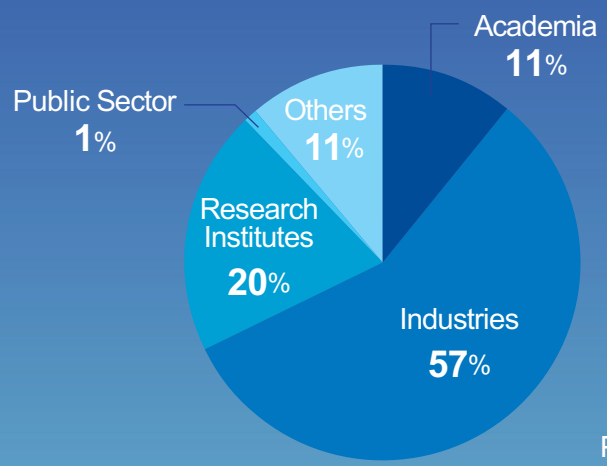
EE by the Numbers

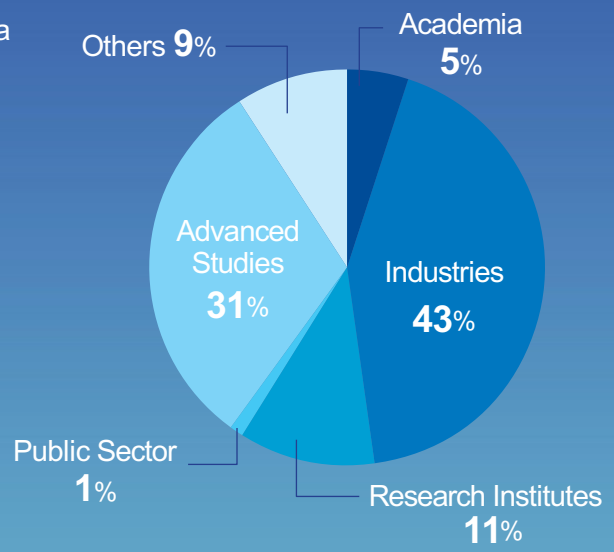
(as of fall 2023)

Alumni Career Path

Ph.D



BS & MS



Global Reputation

QS Ranking	23rd (2023)
Electronic Circuits	1st in ISSCC for 14 consecutive years
Machine Learning and AI	11th in the number of papers published in collaboration with the Graduate School of AI in ICML, the highest level in Asia in the fields of computer vision, AI, and deep learning
Computer Vision & Computer Architecture	4th in the CSRankings
Computer Systems	9th in the CSRankings

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Education

Where the Brightest Minds Unite, Think Outside the Box, and Push the Boundaries

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Education

Innovative Thinking and Real-World Problem Solving

- Fostering creative thinking to tackle real-world challenges

Integrated Research-Education Approach

- Emphasis on grasping core principles and their application through integrated research and education

Hands-On Experimental Courses

- Focus on practical, hands-on experimental learning

Interdisciplinary + Advance Tech Centric Courses

- 162 interdisciplinary courses + over 40 courses in AI, machine learning, big data, and quantum computing

Edu4.0 Integration

- 15 courses utilizing Edu4.0, KAIST's flipped e-learning pedagogy

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6 Divisions

Circuit

Communication

Computer

Device

Signal

Wave

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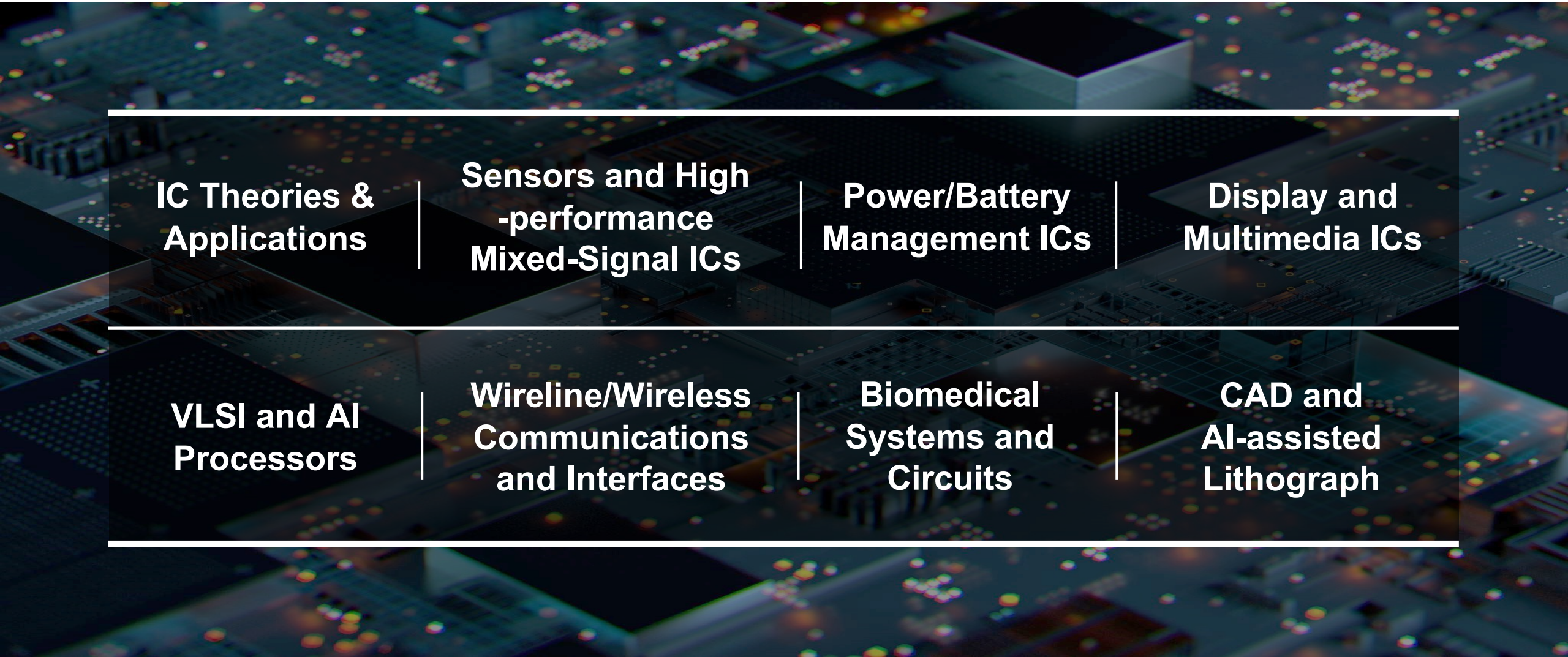
Circuit Division



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Communication Division

Communication	Machine Learning	Data Science
- Non-terrestrial networks - mmW beamforming - Unmanned vehicle communication via 6G services	- Deep learning theory/ design/applications - Reinforcement learning - Meta learning - Generative model	- Data processing/storage - Data security/privacy/ fairness - Quantum communication

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Computer Division

Computer Architecture & Systems	Cloud & Network Systems	Mobile/IoT	System Security
Operating System	AI/ML/Data Science	Self-Driving Cars/Drones	

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Device Division

Nano/ Semiconductor Devices

Flexible Electronics & Display

Bio-Healthcare Devices

High Speed Electronics

Sensors and Wearable Devices

Quantum and Energy Devices

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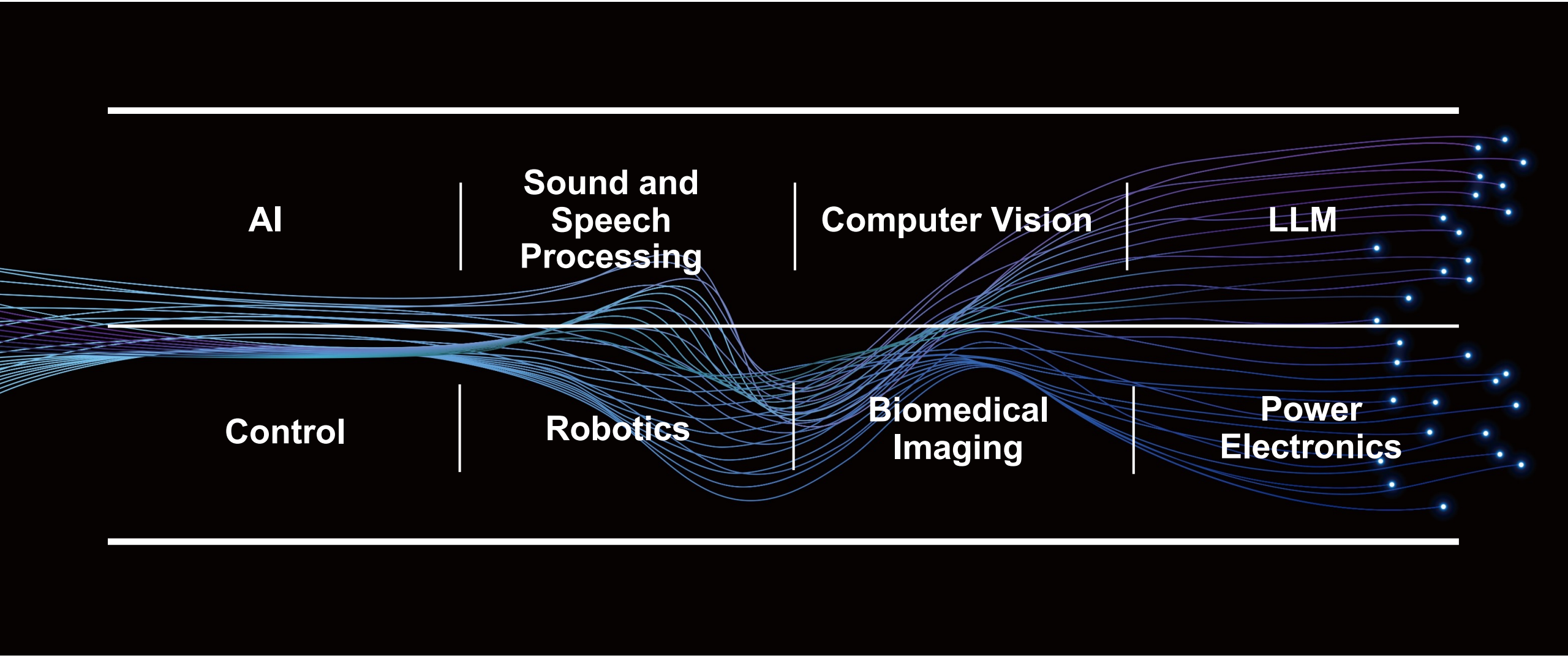
Signal Division



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Wave Division

Photonics

- Photonic devices & systems
- Metamaterials & surfaces
- Photonic integrated circuits
- Optical communications

Electromagnetic Waves

- Active antenna systems
- Radar signal detection
- Microwave circuits & systems
- Electromagnetic interference
- Wave theory

Quantum Science and Technology

- Quantum computing
- Quantum communication
- Quantum sensing
- Quantum devices & systems

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Semiconductor-Intensive Program

Department of Semiconductor System Engineering

- Sponsored by Samsung Electronics, emphasizing practical education on semiconductor systems, circuits, components, processes, and software.
- Aims to matriculate 100 undergraduates annually by 2026, destined for employment at Samsung

Graduate School of AI Semiconductor

- Founded under the Ministry of Science and ICT's AI Semiconductor Advanced Talent Development Project
- Specialized curriculum covering AI system architecture, circuit research, and fostering industry-academia collaboration with global networking

Graduate School of Semiconductor Technology

- Established via the government's Semiconductor Specialization Graduate School Support Program
- Focuses on interdisciplinary semiconductor education from concept to design, processes, components, and evaluation, fostering crucial figures in the semiconductor industry

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Industry Collaboration Program

Nurturing Real-World Problem Solvers

- KAIST Educational Program for the Semiconductor Industry with SK Hynix (KEPSI)
- Educational Program for Samsung Semiconductor (EPSS)
- Lgenius Program
- KAIST Future Mobility Program with Hyundai Motor Group
- Educational Program for Samsung Display (EPSD)
- KAIST Robotics Program with Samsung Electronics

Reskilling and Upskilling Programs

- SK Hynix-KAIST ASK program
- SeongNam-KAIST AI Intensive program

SK hynix SAMSUNG LG Display

HYUNDAI SAMSUNG DISPLAY

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Co-Op Program

6+2 Hands-On Internship

- Third and fourth-year undergraduates undergo up to six months of practical training at partner companies during a semester
- Preceding their work, students engage in two months of individual research, aligned with company responsibilities, with designated labs and faculty guidance for a comprehensive understanding before the training

Externship Program for Tech Startup Entrepreneurs

- Eight-week internship designed for third-year undergraduates and new graduate students
- Focuses on connecting students with technology startups, small to mid-sized companies, and accelerators in the early-stage entrepreneurial venture ecosystem, offering hands-on experience

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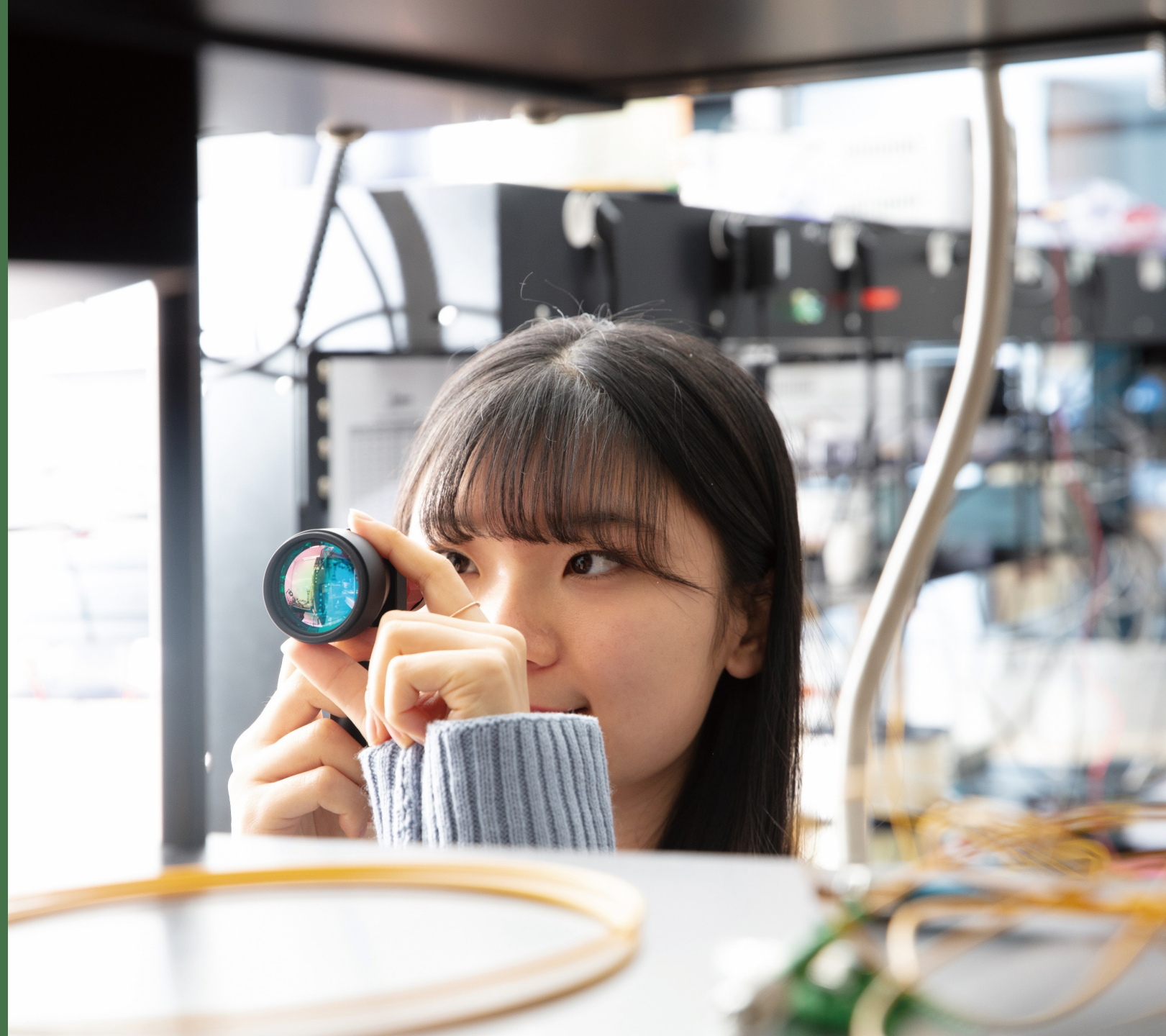
Research

Unraveling Creative Innovation

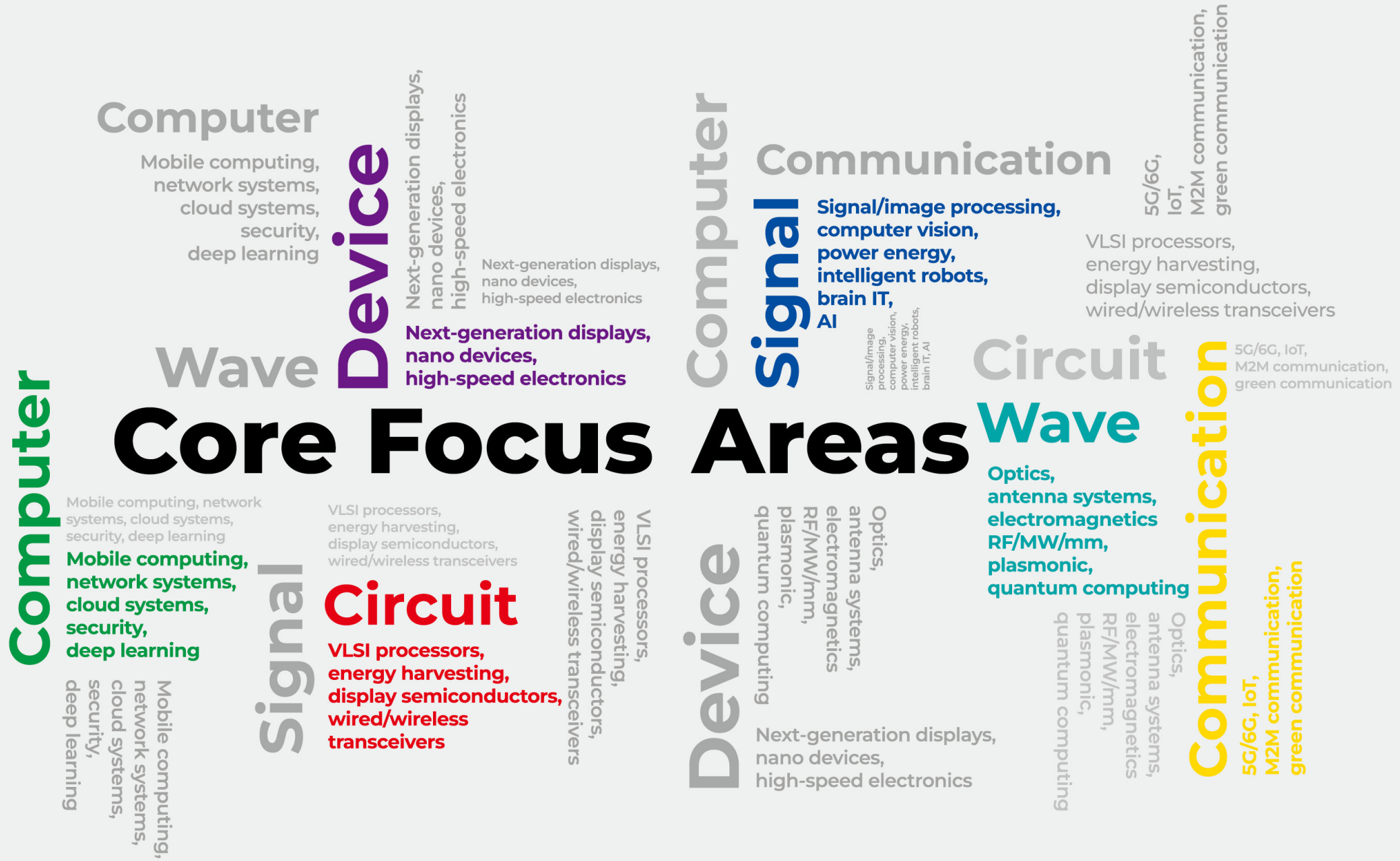


Collaborative Research Ecosystem

Emphasis on Collaborations Across Public and Private Sectors

39 Government-Funded Research Centers & 87 Labs Drive Collaborative, Multidisciplinary Research

Resulting Groundbreaking Innovations Significantly Enhance Education Excellence


Computer
Mobile computing, network systems, cloud systems, security, deep learning
Device
Next-generation displays, nano devices, high-speed electronics
Next-generation displays, nano devices, high-speed electronics
Next-generation displays, nano devices, high-speed electronics
Wave
Computer
Signal
Signal/image processing, computer vision, power energy, intelligent robots, brain IT, AI
Communication
5G/6G, IoT, M2M communication, green communication
VLSI processors, energy harvesting, display semiconductors, wired/wireless transceivers
Circuit
5G/6G, IoT, M2M communication, green communication
Core Focus Areas
Computer
Mobile computing, network systems, cloud systems, security, deep learning
Mobile computing, network systems, cloud systems, security, deep learning
Mobile computing, network systems, cloud systems, security, deep learning
Signal
VLSI processors, energy harvesting, display semiconductors, wired/wireless transceivers
Circuit
VLSI processors, energy harvesting, display semiconductors, wired/wireless transceivers
VLSI processors, energy harvesting, display semiconductors, wired/wireless transceivers
Device
Optics, antenna systems, electromagnetics RF/MW/mm, plasmonic, quantum computing
Optics, antenna systems, electromagnetics RF/MW/mm, plasmonic, quantum computing
Next-generation displays, nano devices, high-speed electronics
Wave
Optics, antenna systems, electromagnetics RF/MW/mm, plasmonic, quantum computing
Communication
5G/6G, IoT, M2M communication, green communication
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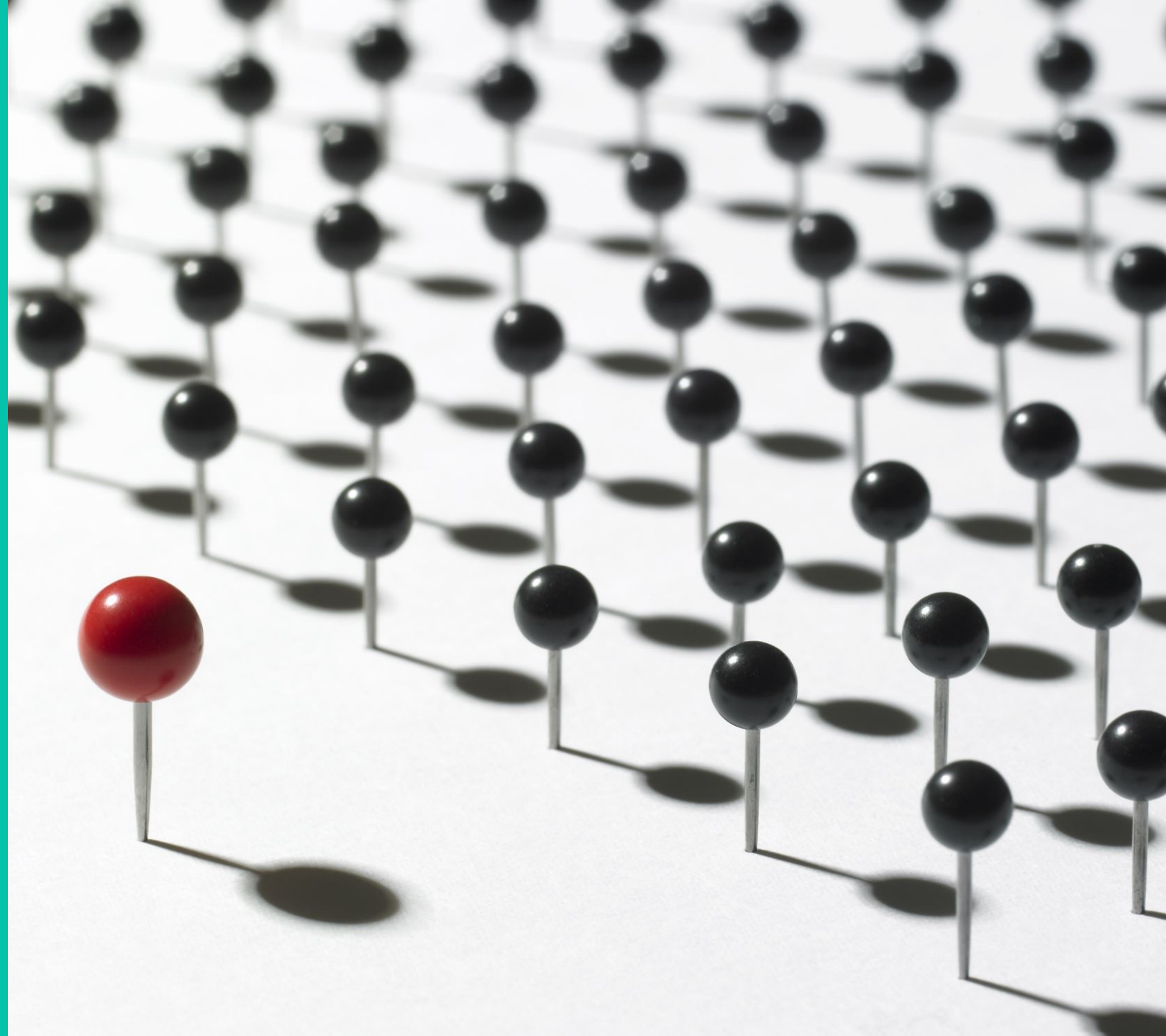
Research Highlight



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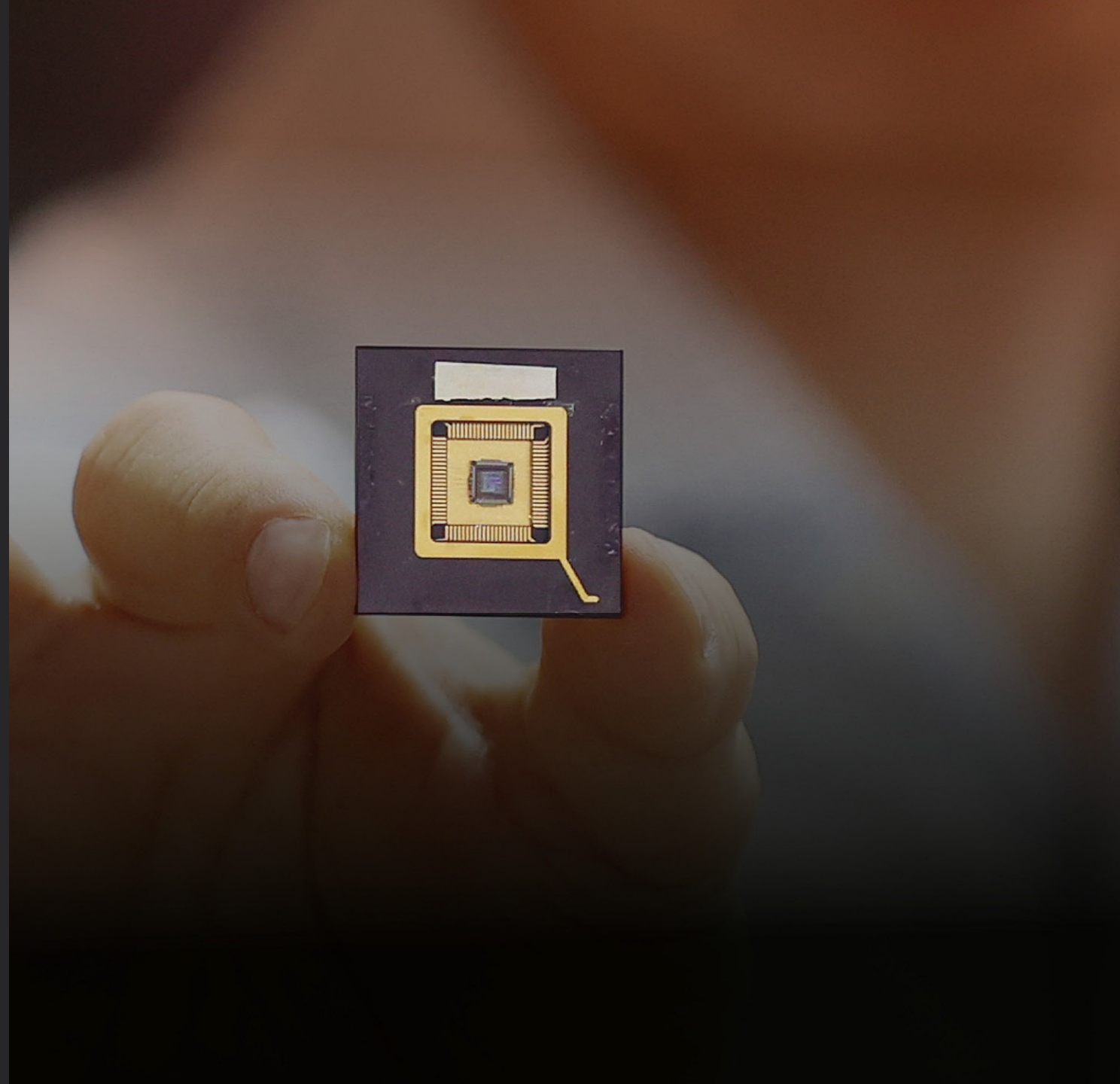
Transforming Tomorrow: AI+X Semiconductor Innovation

System Semiconductor
Packaging Research Lab
Professor Joungho Kim



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Making a Mark in the Self-Driving Technology Industry

Unmanned Systems Research Group
Professor Hyunchul Shim

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Wirelessly Rechargeable Soft Brain Implant Controls Brain Cells

Bio-Integrated Electronics and Systems Lab

Professor Jae-Woong Jeong

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Washable and Flexible Transparent OLED Utilizing MXene Nanotechnology

Advanced Display and Nano Convergence Lab

Professor Kyung Cheol Choi

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DreamWaQer : A Quadrupedal Robot for Dark Environments

Urban Robotics Lab

Professor Hyun Myung

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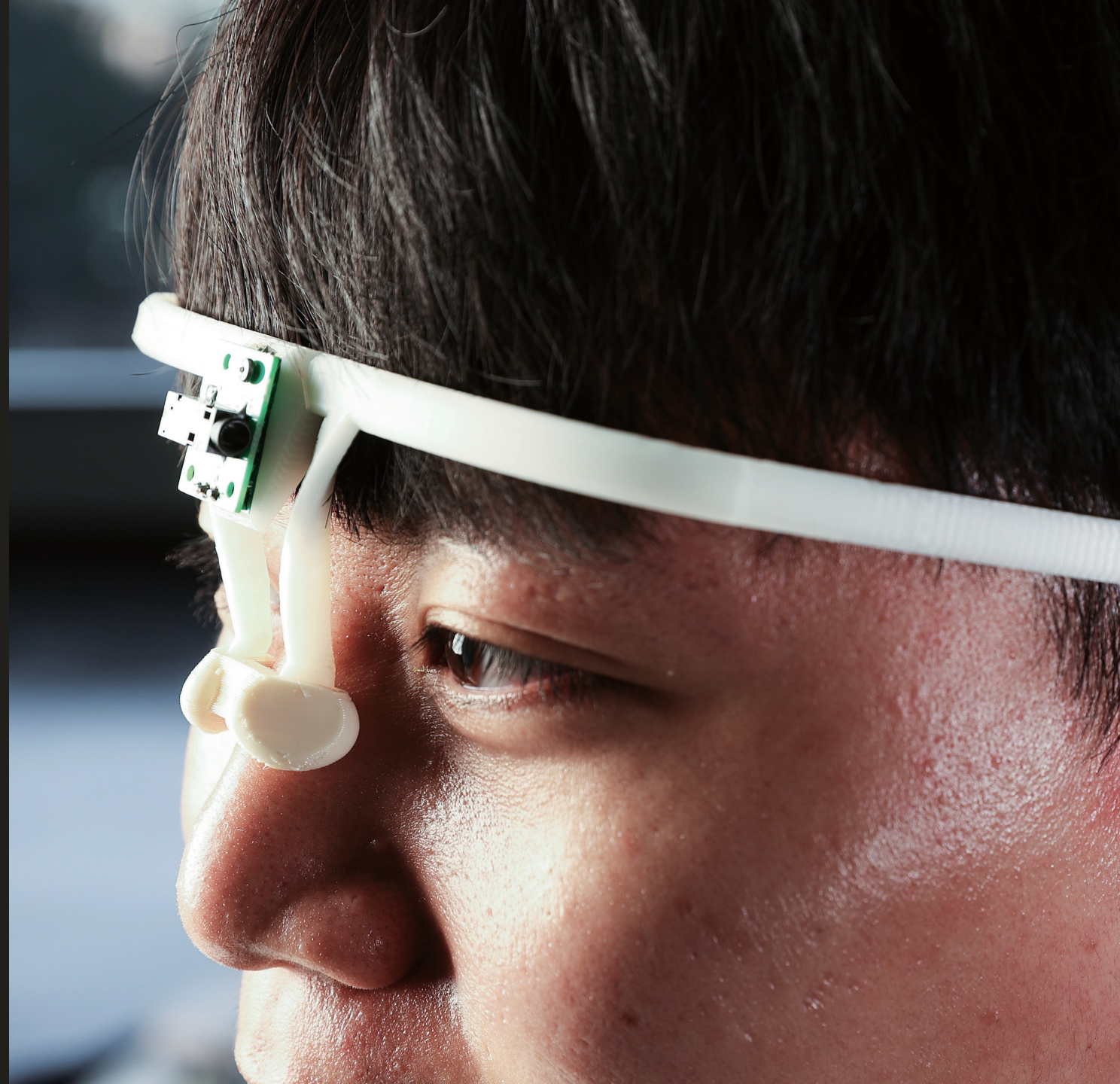
Smart Glasses Securing Access in a Touchless Interface

Wearable and Interactive Technology Lab

Professor Ian Oakley



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Global Partnership

Expanding Global Horizons

KAIST EE

Global Partnership

- **330 Global Partners**
- **International Dual Degree Programs**

• KAIST-Georgia Institute of Technology Dual BS 2+2 Program
• KAIST-Technical University of Denmark MS 1+1 Program

KAIST EE X GEORGIA TECH

KAIST EE X DTU

KAIST EE

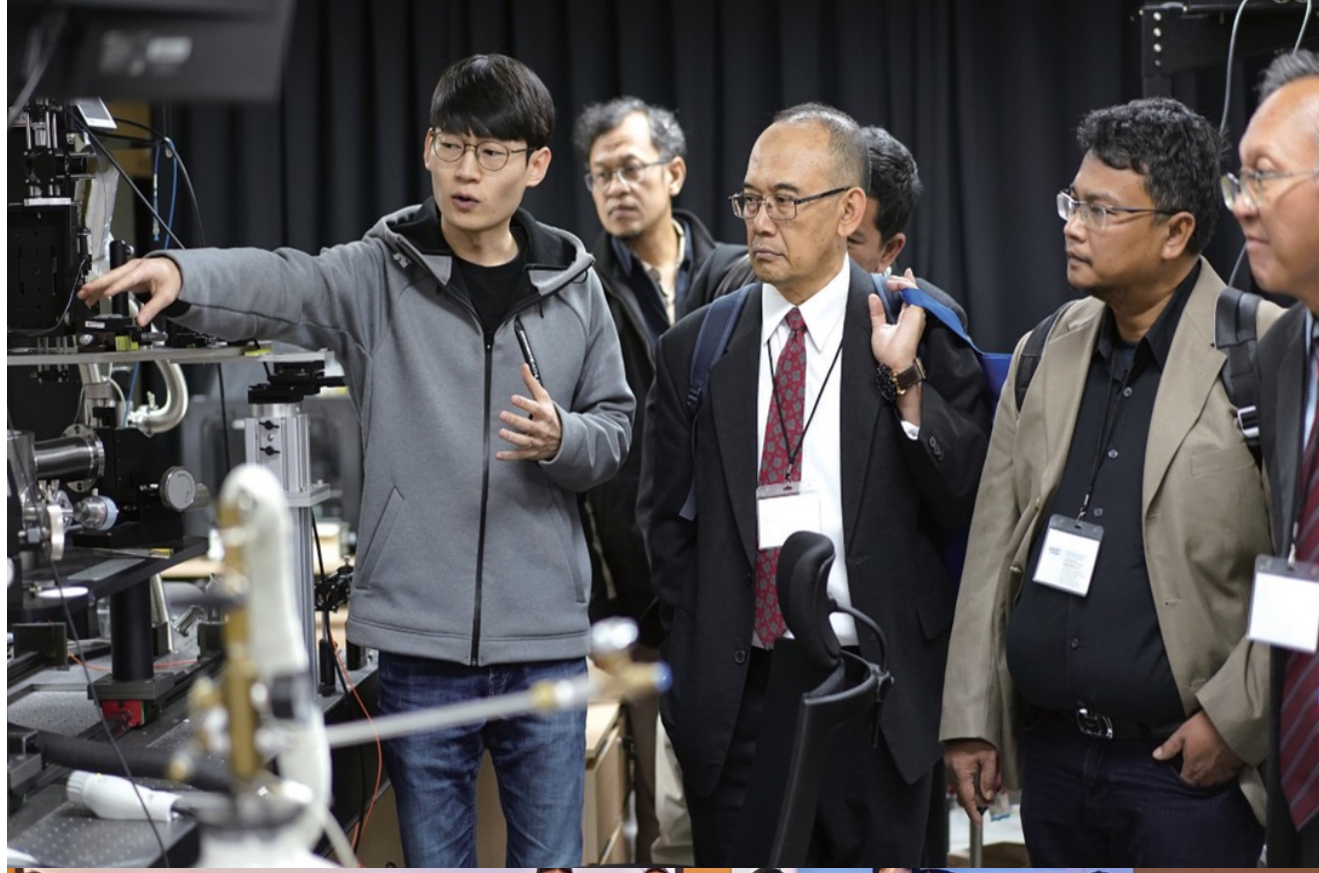
EE Visit Camp

- **Hosts undergraduates from partner universities exploring advanced studies at KAIST EE**

KAIST EE

KEEP-I

- Hosts esteemed professors from partner universities annually for research portfolio showcases to facilitate future collaborations



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Entrepreneurship

Innovators Network Around the Globe

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Leadership in Key Technology Industry

SAMSUNG

SK hynix

- Around 9% of Samsung Electronics executives, including former CEOs Oh-Hyun Kwon and Ki-Nam Kim, are KAIST alumni
- 15% of SK Hynix executives also hail from KAIST, predominantly from the School of EE

Academic Influence

- Graduates hold tenure-track faculty positions at 68 Korean universities and seven overseas institutions

Technological Pioneering

- Alumni are instrumental in spearheading cutting-edge technologies in globally recognized IT companies

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SiFive

Yoon-Sop Lee (BS '01)

Revolutionizing Chip Design

- Based in Santa Clara, California, SiFive pioneers chip designs using open architecture RISC-V
- Aims to disrupt Arm Ltd's dominance by supplying pivotal chip design components
- Achieved a 2022 valuation of approximately 2.5 billion USD after a 175 million USD funding round

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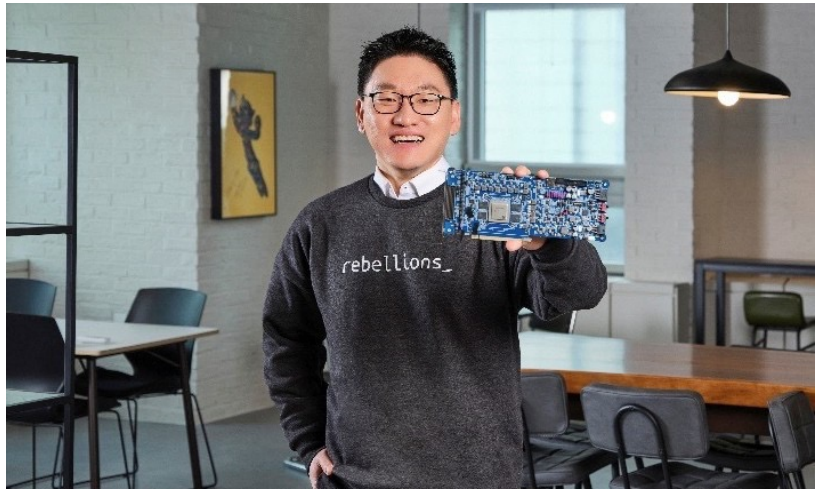
Rebellions Inc

Sunghyun Park (BS '02)

rebellions_



Pioneering AI Chip Design

- A frontrunner challenging Nvidia in AI chip design and manufacturing
- ATOM chip specialized for computer vision and chatbot AI, using about 20% of Nvidia's power for these tasks
- Received over 76 million USD in investments within three years of establishment

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Lion Semiconductor

Won-Young Kim (BS ‘03)

LION SEMICONDUCTOR

Advancing Power ICs

- Based in Silicon Valley, specializes in high-efficiency switched-capacitor power ICs for rapid wired and wireless device charging
- Supported by prominent semiconductor investors like Walden Riverwood, Atlantic Bridge Ventures, and SK Hynix
- Acquired by Cirrus Logic for 313 million USD in 2012

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Panmnesia

Professor Myoungsoo Jung

panmnesia

CXL Technology Advancement

- Fabless semiconductor company focused on advancing Compute eXpress Link (CXL) technology
- Specializes in CXL Intellectual Property (IP) development, facilitating seamless connections among system devices
- Enables dynamic memory utilization and cost-effective management in data centers, cloud, and high-performance computing
- Secured $12.5 million in seed funding recently, solidifying its position as a semiconductor industry leader

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Qunova Computing

Professor June-Koo Kevin Rhee

QUNOVA COMPUTING

Quantum Innovation

- Pioneering Korea's foray into quantum computing
- Focuses on quantum simulations and AI to revolutionize medication and materials research
- Aims to provide sustainable solutions addressing global challenges

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HyperAccel

Professor Joo-Young Kim

Advancing Generative AI

- Develops a novel semiconductor infrastructure, enhancing generative AI accessibility
- Designs processors and servers surpassing current GPU solutions
- Innovations include the Latency Processing Unit (LPU), the first AI processor for generative AI, and the appliance server Orion.
- Strategic partnerships with tech leaders in data centers, mobile, and edge computing, offering semiconductor IPs and low-power solutions

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MilliTrack

Professor Song Min Kim

MilliTrack

Precision RTLS Innovation

- Elevates indoor Real-Time Location Systems (RTLS) with unprecedented precision and range
- Introduces the world's first RF tag with 0.3mm accuracy, 150-meter range, and concurrent positioning of over a thousand tags in real-time
- Utilizes millimeter-wave spectrum, ensuring a compact form factor, 40-year battery life, and cost-effective deployment
- Revolutionizes high-precision robot control, immersive realities, and comprehensive monitoring in smart factories

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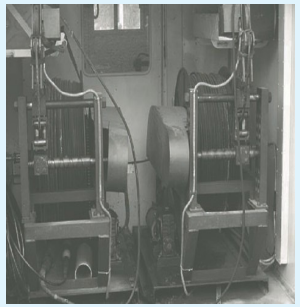
EE Trailblazers: Driving Korea's Technology Forward

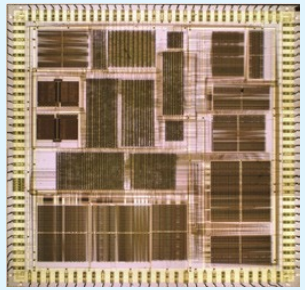
1975
Pioneer's Invention Ignites the Era of Korean Microwave Ovens
Professor Jung-Woong Ra

1986
Innovative Radar Technology Unveils North Korean Tunnel Threat
Professor Jung-Woong Ra

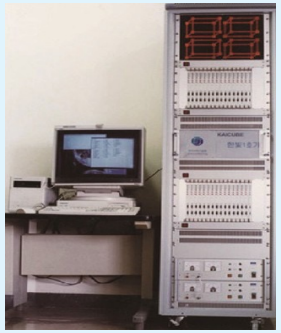


1986
Korea's Space Exploration Begins with KITSAT-1 Launch
Professor Soon-Dal Choi and Professor Dan-Keun Sung

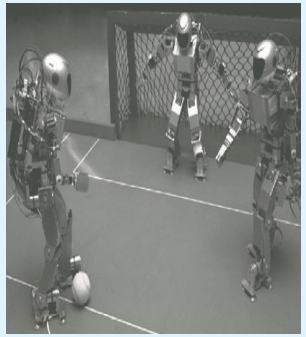
1995
1995: Korea's Microprocessor Milestone - The Birth of HK 386"
Professor Jong-Min Kyung



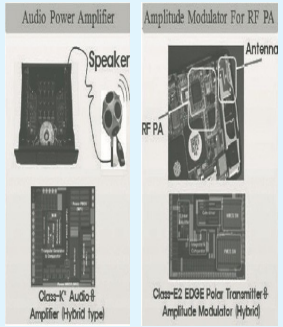
1995
Supercomputing Revolution – the Birth of Habit-1
Professor Kyu-Ho Park



1995
Robot Soccer Takes Root at KAIST
Professor Jong-Hwan Kim



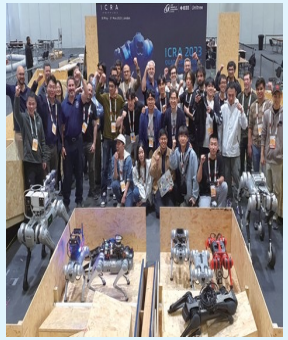
1999
First Faculty Startup with High-Performance Audio Amplifier
Professor Gyu-Hyeong Cho



2009
Wireless Charging Electric Bus Paves the Way for Future Mobility
Professor Dong Ho Cho

2015
Hubo Wins DARPA Robotics Challenge
Professor In So Kweon

2023
DreamWaQer Wins the 2023 Quadruped Robot Challenge
Professor Hyun Myung



Thank you

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