− Graduate Admissions Fair in Seoul

Date & Time		Location
June 29 (Fri.)	13:00~15:00 International student	EL Tower, Yangjae-dong, Seoul
	16:00~18:00 Korean student	

- Group meeting time with DGIST professors and enrolled students
- Application must be submitted in advance.

− DGIST Open Lab.

Date & Time		Location
Sep. 29 (Sat)	12:00~17:00	DGIST Consilience Hall L29 (Auditorium)

- Free shuttle bus service to DGIST
- Introduction of DGIST & application guidelines, Lab tour, etc.
- Expenses of intercity transportation, Lunch and Gifts will be provided

− How to Apply

Download a Registration Form (admission.dgist.ac.kr) >> Email Submission (to admission@dgist.ac.kr)

− Contact info.

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Explore DGIST virtual campus!
www.dgist.ac.kr/virtualtour

DGIST 대구경북과학기술원
Daegu Gyeongbuk
Institute of Science & Technology

Our excellent MIREBraiN program will lead us to the Innovative University Changing the world through Convergence

DGIST is an Institute of Science and Technology established by the Korean government under a Special Act for strengthening nation's science and technology. Since its beginning as a government-funded research institute, DGIST has been growing as a leading university of science and engineering.

VISION
Innovative University Changing the World through Convergence

3 Innovation Strategies

Innovative education
Innovate education paradigm for fostering future talents in science & technology

Research excellence
Innovate research system for advanced science & technology

Value creation
Create social value through the development of ecosystem for science and technology innovation

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The Uniqueness of DGIST :

The only university which has R&D division as well as Academic division

College of Transdisciplinary Studies
- School of Undergraduate Studies

Graduate School
- Emerging Materials Science
- Information and Communication Engineering
- Robotics Engineering
- Energy Science & Engineering
- Brain & Cognitive Sciences
- New Biology

Convergence Research Institute
- Convergence Research Center for Solar Energy
- Convergence Research Center for Wellness
- DGIST-LBNL Research Center for Emerging Materials
- Research Center for Resilient Cyber Physical Systems
- Convergence Research Center for Microlaser Technology
- Convergence Research Center for Future Automotive Technology
- DGIST-ETH Microrobotics Research Center
- Core Protein Resources Center
- Well Aging Research Center
- Convergence Research Center for Collaborative Robots
- Global Center for Bio-Convergence Spin System
- Companion Diagnostics and Medical Technology Research Group
- Smart Textile Convergence Research Group
- Magnet-Controlled Materials Research Group
- Intelligent Devices and Systems Research Group

Synergy of education-research cooperation

MIREBraiN education & research

Application and commercialization oriented research

Graduate & undergraduate school

Cooperative research

Convergence research institute

Oriented on basic research

National Role Model of education-research cooperation

Oriented on application and commercialization research
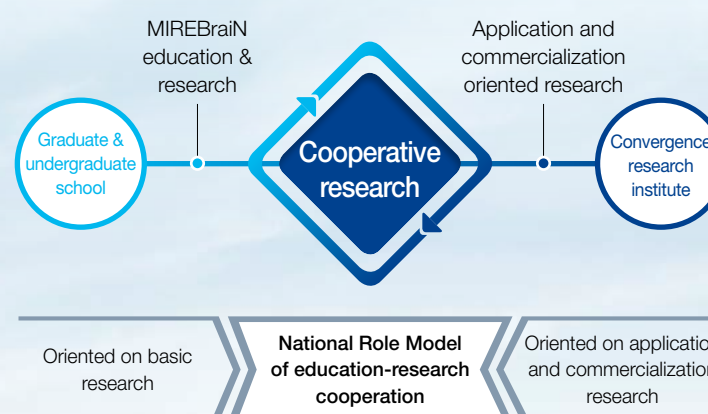
Strategic Focus Areas : MIREBraiN

MIREBraiN stands for the six strategic areas on which DGIST focuses its research and education.
Through the strategic focus in convergence areas, DGIST fosters the future brains of the nation and world who transform their creativity and convergence thinking to new discoveries.

M Emerging Materials Science
- Emerging quantum matter
- Nano-bio accreted matter
- Creative matter theory

I Information and Communication Engineering
- Cyber physics system
- Smart connection system
- Biomedical system

R Robotics Engineering
- Surgery / recovery / assistant robots
- Micro / nano robots
- Core robot technology

E Energy Science & Engineering
- Secondary batteries & fuel cells
- Next-generation solar panels
- Photocatalyst reaction
- Renewable energy

B Brain & Cognitive Sciences
- Neurodegeneration and metabolism
- Sensory sciences
- Synapse and nerves
- Biophysics
- Cognitive Neuroscience

N New-Biology
- Life sciences biochemistry
- Analysis of life phenomenon
- Complex life sciences
- Quantum biology

Spring 2019 Graduate Admission Guide

Admission Timeline

Classification	Online Application	Interview
Spring I 2019	June 28 (Thu) ~ July 12 (Thu)	Aug. 6 (Mon) ~ Aug. 13 (Mon)
Spring II 2019	Oct. 11 (Thu) ~ Oct. 25 (Thu)	Nov. 12 (Mon) ~ Nov. 19 (Mon)
Spring III 2019	Dec. 13 (Thu) ~ Dec. 27 (Thu)	Jan. 14 (Mon) ~ Jan. 21 (Mon), 2019

※ Semester : March ~ June [Spring] / September ~ December [Fall]

Majors and Programs

Majors	Programs
Emerging Materials Science	M.S., Integrated M.S.&Ph.D., Ph.D. ※ Note that you could get an admission for M.S. program according to the evaluation results, even if you applied for the Integrated M.S. & Ph.D. Program.
Information and Communication Engineering	
Robotics Engineering	
Energy Science & Engineering	
Brain & Cognitive Sciences	
New Biology	

Benefits

Classification	Details
Tuition	- Full scholarship for all graduate students
Stipend	- Ph.D. : Teaching assistant allowance(including meal allowance), RA/TA scholarships - M.S. : Learnfare(including meal allowance), RA/TA scholarships
DPF (DGIST Presidential Fellowship)	- Special scholarship : 3,000,000 KRW / semester - Research scholarship : Maximum 10,000,000 KRW - Study abroad scholarship : Maximum 16,584,000 KRW ※ The amounts are subject to change.
Government Research Project	- DGIST Convergence Research Institute (12 centers, 4 research groups) - Affiliated Research Institute/Center - Korea Brain Research Institute(KBRI) - Center for Plant Aging Research, Institute of Basic Science
Dormitory	Convenient on-campus dormitory facilities with inexpensive housing fees

※ Details on the scholarships will be released by each department on their website.

Innovative University Changing the World through Convergence

admission.dgist.ac.kr

DGIST

Spring 2019 Graduate Admission

MIRE BraiN

Innovative education

Research excellence

Value creation

Emerging Materials Science

Pursuing the state-of-the-art science on new materials via interdisciplinary research

Overview
Cultural and scientific revolutions in human history have always been with the new discovery or development of new 'synthetic' materials, People never stopped innovating and overcoming the natural resources to achieve the technological breakthroughs and advancements, which has been the main driving force for the growth of modern societies. Materials science has been at the core of these modern technological developments. Department of Emerging Materials Science(EMS) at DGIST aims to stay at the core of these technological trends and lead the progresses of modern materials science, as well as to foster global leaders, to define the future technologies.

Vision
- Frontier research in the field of materials science with the aim to make contributions to humanity.
- Produce creative researchers with convergence scientific minds based on broad disciplines of science.
- Development and education of globalized research capacity in Korea and setting the collaboration networks with global academic leaders.

Research and Education
- Make progress in our understanding on diverse material systems through the modern experimental and theoretical studies and stay at the forefront of the material research.
- Provide the frame for the multidisciplinary education of the next generation with the contemporary convergence research.
- Research program at world-leading groups to promote international and multidisciplinary collaboration in materials science
- Annual student-led workshop for stimulating discussion and collaboration among students in different fields

Specialized Research Fields
- Research and development of new materials and phenomena based on understanding of quantum mechanical correlations between atoms.
- Understanding and applications of nano- and bio-materials with the focus on emerging new properties due to the nanoscale size.
- Exploration of new functional properties via the theoretical studies of electronic and dynamic structure of materials.

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  (Max-Planck-Institur fur Physik komplexer Systeme)
- Prof. Joon Won Park
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- Dr. Samuel D. Bader
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Information and Communication Engineering

Embracing the next generation through convergence of information and communication

Overview
Information and Communication, which is considered as a core of the future knowledge society, takes a key role in the convergence with Bio Technology(BT), Culture Technology(CT), Energy Technology(ET), Nano Technology(NT), Robot Technology(RT), etc. The department fosters information and communication professionals equipped with 1) creativity for seeking new research and development directions in the advancement of our future industry, 2) practicality for solving real world problems, 3) globalization for embracing international perspectives, and 4) social entrepreneurship for generating added value in existing or novel applications

Vision
- Becoming the department of excellence with international academic recognition
- A divancing core technologies needed for the development of future industries
- Educating professionals equipped with both the ability of global research & development and the sense of technology management
- Opening up new fields through information and communication convergence with other fields of study

Strategies
- **Research**
  - Understand the challenges in medical fields and apply basic theories and technologies appropriately
  - Run the whole cycle of R&D in close collaboration with medical staffs
  - Extend the developed core technologies to other research and industrial fields
- **Education**
  - Intensive on-site education and training
  - Strengthen the fundamental courses and foster multidisciplinary convergence education
  - Self-motivated learning to promote logical thinking and creativity
  - Encourage care and communication, and strengthen research ethics

Research and Education Focus
- Medical robotics to combine robotics engineering with medical applications.
- Major research areas : Surgical Robot, Rehabilitation Robot, Life Support Robot, Robot Design & Service Robot, and Bio Micro-Nano Robots/BRI
- Converged robotics engineering through interdisciplinary education, system integration education, team based working process, and project-based practical learning process. practical learning process.

Specialized Research Fields
Robotics Engineering Department conducts robotics researches to develop creative fusion technologies by converging conventional engineering subjects(Mechanical, Electrical, Electronics Engineering, Mechatronics, etc) with advanced high technologies such as Biotechnology(BT), Information Technology(IT) and Micro & Nanotechnology(MT/NT). With this fusion technologies, the department will focus on the biomedical robotics fundamental researches on Robot Mechanism Analysis and Design, Precision Actuator and Sensor, Biometric sensing(bio-sensors), Control System, Biomodeling, Medical Simulation, Optical System Design, Biomedical Imaging, and Micro/Nano Systems Design & Fabrication.
- **Surgical Robot** : Advanced robotic technologies

that provide advanced eyes and hands for surgeons to assist more accurate and safe surgery through the image-guided minimally invasive surgery. Surgical simulation based on virtual and augmented reality technologies helps surgeons to practice surgical skills preoperatively.
- **Rehabilitation Robot and Life Support Robot** : Rehabilitation robots that help recover or assist the motor/cognitive functions of the handicapped and impaired persons. Life support robots such as welfare assistant and home care robots that improve quality of life of the beneficiary.
- **Bio Micro-Nano Robots/BRI** : Exploration, diagnosis and drug delivery for targeted areas; treatment of the brain and human body through the use of micro/nano robots and artificial sensing systems/control of robots, artificial prosthesis and external devices using BRI.
- **Robot Design & Service Robot** : Robot design and optimization for medical and other advanced robotic applications based on advanced robot mechanism, sensors, actuators, control, machine vision, motion planning, navigation, etc., and innovative service robots to improve the quality of human life.

Convergence with Other Majors
- Although DGIST is still at its growing stage, the Robotics Engineering Department will conduct an international education-research program called "Global Alliance Program" that collaborates with world leading universities.
- The department will invite world renowned professors to give lectures, cooperervise student thesis, and conduct cooperative research.
- The department will promote exchange of visits at the level of professor / research staff, and students' internship programs in order to encourage their international experience.

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- Prof. Byung Ju Yi (Hanyang University)
- Prof. Sung Ho Jang
  (College of Medicine, Yeungnam Univ.)

Robotics Engineering

A Mecca of core-technologies in medical robotics - the aspiration of Robotics Engineering Major of DGIST

Overview
- In the medical field, robots have performed numerous missions instead of human being to improve the quality of life as well as human health and welfare.
- In order to become a leader of next decade, advanced countries have investigated and spurred on the robot technology as a new growth engine.
- Since the research areas of medical robots have rapidly grown with the infinite possibilities, people who have experienced skills and challenging spirit can dedicate their effort to research, and prepare for the upcoming new future.

Vision
- We aim to research core technologies of future robotics toward humancentered medical services in the 4th Industrial Revolution Era, and to educate interdisciplinary experts in robotics who understand the challenges in the fields and define the problems by one's own, and solve those problems actively and collaboratively.

Convergence with Other Majors
- **Convergence with Emerging Materials Science** : Research on electronic devices based on new materials
- **Convergence with Robotics Engineering** : CPS and brain mapping based rehabilitation robot technologies, Machine-learning based brain machine interface, Sensor and actuator wireless interface
- **Convergence with Energy Engineering** : Energy IT convergence technologies including smart grid and renewable energy
- **Convergence with Brain & Cognitive Sciences** : Medical imaging, Biomedical signal processing, Nano devices with possible application to human body, Database and data mining for medical applications, Biomedical wireless communications and education
- **Convergence with New Biology** : Next Generation Sequencing(NGS) genome data analysis, Large-scale protein mass spectrum data analysis

- Biomedical communications and signal processing
- Brain-machine interface / Brain-computer interface(BMI/BCI)
- Biomedical Imaging and Mobile healthcare systems

Specialized Research Fields
- **Cyber-Physical Systems**
  - Real-time embedded systems
  - Smart homes and intelligent transportation systems
  - AI-based context awareness and decision support
  - Control and modeling
  - Big data systems and big data mining
  - Physical-layer security
- **Connected Smart Systems**
  - Internet of Everything (IOE)
  - Nano communication devices
  - Resilient networks for cyber-physical systems
  - Satellite communications networks
  - Cross-layer communication and signal processing
  - Vehicular communications
- **Intelligent Computing Systems**
  - Medical information systems
  - Computer systems
  - Big data analysis
  - Artificial intelligence and machine learning
- **Bio-Medical Systems**
  - Biosignal sensing system and biomimic devices
  - Smart healthcare
  - Bioinformatics and neuroinformatics

Faculty
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- Prof. Jae Ha Kung
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- Prof. Daehoon Kim | https://cas.dgist.ac.kr
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- Prof. Hoon Sung Chwa
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- Prof. Youngmi Baek
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- Prof. Anna Seo (Konkuk University, CE)
- Prof. Safdar H. Bouk (Keio University, Japan)

Visiting Chair Professor
- Prof. Wook-Hyun Kwon (Brown University)
- Prof. Kyu-Young Whang
  (Stanford University)

Energy Science & Engineering

Research and Development of environmentally friendly renewable energy sources and the devices

Overview
Securing sustainable and environmentally friendly energy resources is an important task to accomplish human survival in future. Frontier science and technology are extensively searching for such power sources as well as systems utilizing the renewable energies. With this wide range of social movement, it is required to shift the conventional education paradigm innovatively to have students handle new forms of the energies. The Department of Energy Science & Engineering in DGIST aims at educating graduate students to contribute to the new generation of renewable energies with the creative mind.

Vision
- State of the art courses fostering competent scientists and engineers for the beyond conventional energy sources
- Creation of core academic areas and policies for future green energy society
- Education of graduate students for future-oriented and creative R&D capability

Research and Education Focus
- Cultivation of international leaders for the convergence energy devices through closely interconnected interdisciplinary system of DGIST.
- International exchange (including double-degree program) and team projects with global top Institutes
- Solution searching education and research experiences to technical challenges

Specialized Research Fields
- Key materials and system design for the advanced hydrogen and bio-fuel cells
- Production and storage of hydrogen and practical applications of renewable energy systems
- Core-material and fabrication technology for the next generation photovoltaic cells
- Photocatalytic water splitting and recycle of the waste products such as CO2 and waste water
- New materials for high energy density Li-ion batteries
- Post-Li batteries including multivalent(Mg, Zn, Ca) ion, metal-air batteries
- New materials for low-energy-consumption electronic devices
- Multi-scale molecular modeling of materials for clean energy

Convergence with Other Majors
- **Information and Communication Engineering** : Electricity storage devices and sensor network system for smart grid to improve the efficiency of renewable energies
- **Robotics Engineering** : Small batteries for micro-robots for medical application, and large-batteries for human care/ industrial robots
- **Brain Biology** : Bio-energy systems for the treatment of brain signals and processing, and biocompatible power sources

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- Prof. Chung, Dae Sung
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Adjoint DGIST Professor
- Prof. Kim, Seong Kyun
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- Prof. Seo, Jungpil (Emerging Materials Science)
- Prof. Woo, Hye Ryun (New Biology)
- Prof. Yoo, Han-Ill
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- Prof. Lim, Pyung-Ok (New Biology)
- Prof. Choi, Gyeung Ho
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- Prof. Choi, Jihwan (Information & Communication)
- Dr. Jae Hyun Kim (Green energy research division)

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- Prof. Watanabe, Masahiro
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- Prof. Yang, Jang-Joo (Seoul National University)
- Prof. Oh, Seung Mo (Seoul National University)
- Prof. Park, O Ok (KAIST)
- Prof. Yoon, Kyung Byung (Sogang University)

Brain & Cognitive Sciences

Leading the world in brain science through convergent education and research

Overview
The brain is the last great frontier in the exciting field of research. Brain & Cognitive Sciences is the study of the fundamental principles of brain structure and function. The integration and convergence of Brain & Cognitive Sciences with others disciplines is rapidly expanding. With interdisciplinary approaches, Brain & Cognitive Sciences research will contribute to not only the field of science but also humanities, social science, and industrial fields.

Vision
We aim to create a world-class research and teaching environment to facilitate Brain & Cognitive Sciences discovery and education, and to achieve the improvement of brain health and human life based on this knowledge. This is accomplished through the training of global practice leaders, technology partnerships, and the establishment of a neuroscience knowledge community.

Research and Education Focus
Specialized education for Brain & Cognitive Sciences by performing cutting-edge research on the structure and function of the brain as a common theme without interdisciplinary barriers

Specialized Research Fields
- **Neurodegeneration and Metabolism**
  - Neuronal cell death and neurogenesis
  - Brain metabolism and metabolomics
  - Neuroinflammation, brain aging and neurodegeneration
- **Sensory Biology and Circadian Rhythm**
  - Chemical Senses & Cognition
  - Circadian Control of Brain Functions and its Mechanisms
  - Convergent Neurotechnology
- **Synapse Neuroscience**
  - Ion Channel Functions in Synaptic Transmission
  - Organizing Principles of Synapses and Neural Circuits
  - Key pathophysiological mechanisms of various synaptic disorders
- **Neural Circuits and Behaviors**
  - Neurobehavior and Neural Circuit
  - Molecular and Neural Circuitry Basis Underlying Neuropsychiatric Disorders
  - Behavioral Neuroscience
- **Computational Neuroscience, Biophysics and Quantum Biology**
  - Protein Biophysics and Quantum Biology
  - Computational Neuroscience and Complex Big-Data Analysis
  - Simplicity from the Complexity
- **High-level Cognitive Neuroscience**
  - Cognitive neuroscience using brain imaging, behavioral psychology and neuropsychology
  - Functional specifications and connections in the human prefrontal cortex

Convergence with Other Majors
with other science and technologies like Physics, Chemistry, NT, BT, and IT. The department of Brain & Cognitive Sciences will pursue cooperation with other divisions at DGIST through a project-based learning model.

Faculty
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- Prof. Erwin Neher
  (1991 Nobel Laureate in Physiology or Medicine)
- Prof. Kurt Wüthrich
  (2002 Nobel Laureate in Chemistry)
- Prof. Hui-Woog Choe

New Biology

Creates a next-generation paradigm of knowledge, technology, and science in the era of the new biology for sustainable humanity

Overview
What is New Biology? The term "New Biology" has been adopted from "A NEW BIOLOGY FOR THE 21ST CENTURY," a report published by the National Research Council of the United States National Academies in 2009. The report describes New Biology as follows : "A New Biology approach - one that depends on greater integration within biology, and closer collaboration with physical, computational, and earth scientists, mathematicians and engineers - be used to find solutions to four key societal needs : sustainable food production, ecosystem restoration, optimized bio fuel production, and improvement in human health."

New Biology Culture
Towards Our Science beyond My Science
- **Companionship** : Introduction of convergence learning from bonding through science culture and education based on mutual respect among members and interdisciplinary cooperation
- **Wall-less Operation** : Create agora type for establishing borderless education and research culture, and participating convergence research by sharing expertise, intelligence, and facilities
- **Boundary-less thinking and Challenge** : Cultivation of world-class talents and creation of a new paradigm for next-generation biological sciences for the advancement of humanity

Innovative Features of Department of the New Biology
- **Five-year PhD Program**
  Conduct curricula and laboratory practices during the first year. Focus on the research program from the second to fifth years
- **World-best Innovative Education**
  - Creativity-oriented education : Students are trained as future leaders who are capable of raising creative questions instead of merely solving given problems and creating knowledge
  - Holistic education : Classes are offered on scientific creativity and logic, scientific communication, and the history of scientific discoveries
  - Academic advisor : Lifelong mentoring is provided throughout and after the Ph.D program
- **Education Track**
  - Interdisciplinary New Biology (INB) Track places graduate students at the forefront of fundamental convergence biological research and provides access to New Biology's cutting-edge core science and technology and modern biology laboratories.
  - Translational New Biology (TNB) Track places graduate students at the forefront of translating biological knowledge and technology into economic, social, medical, and cultural impacts toward better humanity with an emphasis on technology-based business development education with social entrepreneurship in convergence biotechnology and biomedical engineering areas.
- **Agora type for convergence in Education & Research**
- **Lifelong Mentoring**
- **Collaborative Research Environment in association with Major Research Operations**

Specialized Research Fields
- **C4 Aging**
  - Comparative Aging : Revealing common and specific principles underlying aging and senescence of various organisms including plants, animals, and human
  - Computational Aging : Reprogramming of aging networks delineating dynamic interplays among fundamental pathways of aging at the molecular level
  - Cognitive Aging : With rapidly developing aging society, basic understanding on the cognitive aging and degenerative brain disease is required.
  - Curative Aging : Establishing a new paradigm for healthy aging and controlling senescence through challenging, innovative, integrated approaches.
- **C4 Farming**
  - Cell and Molecular Farming : Addressing fundamental biological questions at the molecular level with a specific cellular model system.
  - Computational Farming : Developing a quantitative model to predict the phenotype of plants by defining molecular factors involved in plant growth and aging.
  - Conservative Farming : Seeking solutions to global energy and food security through convergence studies based on epigenomics and multi-omics approaches in plant systems.
  - Creative Farming : Developing creative technology to make farms more "intelligent" and more connected through the so-called "sustainable agriculture"also known as 'smart farming'.
- **Convergence with Other Disciplines**
  - Participation in education and research aimed at acquiring groundbreaking technology to contribute to sustainable humanity(food, energy, medicine, environment, etc.) based on matrix-structured interdisciplinary pursuits with other departments at DGIST
  - Engagement in convergence research projects across various disciplines including nanobio, IT, convergence, robot systems and energy (Example) Nerve Aging and Regeneration Research (DGIST Flagship) / Space Farm / Quantitative Measurements and Control of Human Body Activities Including Aging / New Habitat

Faculty
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