

2018 Summer DGIST Research Internship for Undergraduates

July 2 - August 10 2018, 6 weeks

DGIST Research Internship for Undergraduates aims to provide talented Korean and international students with opportunities to experience research environment of DGIST. Participants will serve their internship at the lab of their choice under the guidance of DGIST faculty members as visiting research students. This summer research session for international students will provide students with valuable experience in research and personal growth while immersed in a foreign culture.

OVERVIEW

Date

July 2 – August 10, 2018 (6 weeks)

Research Area

Various research topics of 6 departments in DGIST Graduate School

- Emerging Materials Science

Quantum materials, Nano / Bio materials, Computational materials

<http://ems.dgist.ac.kr/>

- Information & Communication Engineering

Cyber Physical Systems, Bio-medical Systems, Smart Connected Systems

<https://ice.dgist.ac.kr/en/>

- Robotics Engineering

Surgical Robot, Rehabilitation/Life Support Robots, Bio Micro-Nano Robot / BR, Robot Design & Service Robot

<http://robot.dgist.ac.kr/en/>

- Energy Science & Engineering

Renewable Energy, Energy conversion and storage, Materials design

<http://energy.dgist.ac.kr/eng/>

- Brain & Cognitive Sciences

Neuro-metabolism, Sensory Systems, Neurodegeneration, Theoretical Biophysics

<https://brain.dgist.ac.kr/eng/>

- New Biology

Aging Biology, Nano-bio Imaging, Systems and Complex Biology, Bio-sustainability, Biochemistry and Biophysics

<http://newbiology.dgist.ac.kr/>

ELIGIBILITY

- Undergraduate students who are currently enrolled in undergraduate degree program and in 3rd or 4th years (junior and senior) at the time of participation
- Students with a cumulative GPA of 2.5/4.3 or higher
- Students with high levels of English language proficiency

APPLICATION

Application Period

March 19 – April 6, 2018

Application Documents

- Application form for DGIST Research Internship, including personal statement and research proposal
- A digital copy of academic transcript in English
- A letter of recommendation (to be submitted by academic advisor or faculty member)

How to Apply

1. Send all application documents to irt@dgist.ac.kr.
2. Ask academic advisor or faculty member who knows well about student's research interest and academic ability to send the letter of recommendation by e-mail to irt@dgist.ac.kr.

ADMISSION

Screening

Department Chair and relevant faculty members will review all application documents, including letters of recommendation, and make a decision on acceptance to the program.

Acceptance to the Program

If a student is accepted to the program, the student will receive "Research Internship Acceptance Letter" issued by the department the student applied to.

Registration for Visiting Research Student

Within a few weeks after notification, International Affairs Team will contact the student for "Visiting Research Student" registration. Please note that students are required to submit Tuberculosis test result (taken within 3 months prior to DGIST student dormitory check-in, in English) and a copy of health insurance policy (in English) which covers medical expenses to be incurred during his/her stay at Korea.

LAB OPENINGS

1. Emerging Materials Science

| Lab | Professor | Research Area |
|--|----------------------|---|
| Spin Phenomena for Information Nano-Devices | Chun-Yeol You | Basic science and applications of magnetic thin films and related phenomena for the sensor, memory, logic, and neuromorphic related devices. Preparation of thin films, micro/nano-fabrication, and characterization of magnetic, and structural properties. |
| | Homepage | http://spin.dgist.ac.kr |

2. Robotics Engineering

| Lab | Professor | Research Area |
|--|---------------------|--|
| Multiscale Biomedical Robotics | Sukho Park | Design and fabrication of cell and/or drug delivery microrobot Design and fabrication of shape change soft microrobot Fundamental technology of biomedical micro/nano robot actuation |
| | Homepage | http://mbr.dgist.ac.kr |
| Surgical Robotics | Jaesung Hong | Design and fabrication of surgical robots Development of elemental technologies for surgical navigation |
| | Homepage | http://sr.dgist.ac.kr/ |
| Bio-Micro Robotics | Hongsoo Choi | Microrobots for precise drug delivery Design and fabrication of three-dimensional microrobot for biomedical applications MEMS ultrasonic transducers for cell stimulation MEMS ultrasonic transducers for fingerprint sensing |
| | Homepage | http://mems.dgist.ac.kr/ |
| Neural Interface & Microsystems | Sohee Kim | Understanding of technical components of BMI (brain-machine interface) Understanding of bioelectric signals from brain and muscles Understanding of the relationship between mechanical properties and processing parameters in fabricating polymer-based MEMS devices |
| | Homepage | http://nims.dgist.ac.kr/ |
| Rehabilitation Engineering | Jonghyun Kim | Evaluation of motor imagery-based robot-aided rehabilitation using fNIRS and EEG Control and analysis of interactive treadmill robot for gait rehabilitation Development of wearable sensor for spasticity assessment |
| | Homepage | http://rehab.dgist.ac.kr |

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| SMART Lab | Cheol Song | Design and study of multi-degree of freedom robot mechanism using small scale precision motors In-vivo blood flow measurement using a optical system Study on properties of biological specimen using laser Study of micro-surgical training using a virtual reality(VR) |
| | Homepage | https://smart.dgist.ac.kr/ |
| Motion Control | Sehoon Oh | Control of exoskeleton/exercise/assistive robot using elastic actuators Locomotion control of biped/quadruped robot Biomechanics and human motion analysis Precise driving control of mobile robot/mobility |
| | Homepage | http://control.dgist.ac.kr/ |
| Bio Robot & Mechatronics | Dongwon Yun | Biomimetic Robot Soft Robotics Robot elementary technology : Sensors and actuators Study on the medical application Study on the industrial/military application |
| | Homepage | http://brm.dgist.ac.kr/ |
| Nano Materials & Devices | Hoejoon Kim | Fabrication of graphene integrated soft electronics Development of piezoelectric sensor for fine-dust detection Process development for semiconductor devices |
| | Homepage | http://joonkim.dgist.ac.kr |
| Medical image & Signal processing | Sanghyun Park | Segmentation of interest organs or vessels using machine learning Surgical robot detection and tracking algorithm Development of brain image processing tools |
| | Homepage | http://mispl.dgist.ac.kr/ |
| Intelligent Imaging & Vision Systems | Inkyu Moon | Design of new algorithms to quantify information about important biophysical cell parameters such as 3D morphology/geometry, dry-mass, volume, density as well as dynamics of cells by applying image processing algorithms suitable for holographic cell images Design of new algorithms to handle large-scale holographic image dataset and convert them to the core features |
| | Homepage | https://iivs.dgist.ac.kr/ |

3. Energy Science and Engineering

| Lab | Professor | Research Area |
|-------------|-------------------|---|
| ELSE | Hochun Lee | Analyzing solvation structure of Li-ion battery electrolytes using Raman, NMR and dielectric measurements Developing novel electrolytes for post-Li (Mg/Na/Al) batteries |
| | Homepage | http://dukelee.dgist.ac.kr |

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|---|----------------------------|---|
| GREEN Lab | Su-II In | Solar fuels (Artificial Photosynthesis): CO ₂ conversion into hydrocarbon fuels Photo-bio hybrid microbial Fuel Cell Design/Synthesis/Analysis of quantum nano materials Advanced medical devices (Acupuncture, Brain electrode etc.) Human / Environmental risk assessment of quantum nano materials Nuclear Battery (Beta Battery) |
| | Homepage | http://insuil.dgist.ac.kr |
| Advanced Energy Materials Laboratory | Sangaraju Shanmugam | Development of hydrogen production using non-precious metal based electrocatalyst for solar energy derived polymer/alkaline electrolytic membrane water electrolysis Synthesis of polymer electrolyte membrane applicable to fuel cell and vanadium redox flow battery Preparation of one-dimensional metal oxide nanostructure and evaluation of zinc/lithium-air cell performance |
| | Homepage | http://sangarajus.dgist.ac.kr |
| Battery Materials and Systems Lab | Yong Min Lee | Lithium Secondary Battery Materials (Electrode, Separator, Binder) Design and Advanced Analysis of Electrode, Electrolyte and Cell Battery Modeling and Simulation (Cells and Systems) |
| | Homepage | http://batterylab.dgist.ac.kr |
| Eco Energy Device Lab | Dae Sung Chung | Development of Eco-Friendly Energy Conversion Devices (Synthesis of water-borne organic semiconductor nanoparticles, Fabrication of solar cells and thermoelectric devices based on water-borne semiconductors) Development of Ultra-High Resolution Image Sensors (Fabrication of nanomaterial-based submicron-sized pixels for image sensor application, Design and fabrication of image sensors for smart device application) |
| | Homepage | http://dchung.dgist.ac.kr |

4. Brain and Cognitive Sciences

| Lab | Professor | Research Area |
|--|----------------------|---|
| Laboratory of Neuronal Cell Death | Seong-Woon Yu | Programmed cell death of neural stem cells in stress and AD Regulation of adult neurogenesis in stress and AD Mechanisms of microglia activation and neuroinflammation Role of autophagy in adult neurogenesis and neuroinflammation |
| | Homepage | http://home.dgist.ac.kr/yusw/ |

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| Laboratory of Affective Neuroscience | Hyosang Lee | Our lab is studying the neuronal circuits underlying emotional behaviors, including itch, aggression and fear, and their modulation by glial cells, using the combinatorial approach of in vivo recordings, functional manipulations such as optogenetics and chemogenetics, and mouse behaviors. |
| | Homepage | http://lee.dgist.ac.kr |

5. New Biology

| Lab | Professor | Research Area |
|------------------------|------------------------|---|
| Nanobiomedicine | Minseok. S. Kim | Tissue engineering for peripheral nerve Microfluidic high throughput drug screening system Cancer diagnostic system |
| | Homepage | https://bioDr.dgist.ac.kr/ |

**Laboratories at Department of Information and Communication Engineering are not available for 2018 Summer DGIST Research Internship for international students.*

BENEFIT

Financial Support

All participants will be provided with allowance for their accommodation, meals and miscellaneous expenses. The amount of allowance is KRW 897,000 for summer session.

Accommodation

DGIST Student Dormitory (Biseul Village) will be arranged for program participants. Please note that students are responsible for dormitory fee (Approximately USD 7 a day).

Korean Culture Experience Activities

International students will have chances to experience Korean culture and society first hand every two weeks.

Life Support

Global Lounge provides campus-life related guidance and assistance for international members.

CONTACT

Please feel free to contact us with questions, comments, or requests for information.

International Affairs Team, DGIST

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