Dongsu Choi

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RESEARCH INTERESTS

- Bionic limb systems to overcome physical disabilities
- Neuro-Inspired Bioelectronics of OECT

EDUCATION

Seoul National University (SNU)   **Seoul, Korea**
B.S. in Mechanical Engineering   *Mar.2018 – Feb.2025 (expected)*
Minor in Material Science & Engineering
- Cumulative GPA : 3.61/4.0 *(cum laude)*

Daejeon Dongshin Science Highschool   **Daejeon, Korea**
- Recognized for academic excellence, graduated one year early.   *Mar.2016 – Feb.2018*

RESEARCH EXPERIENCE

Printed, flexible Nano, Neuromorphic & Energy Electronics Laboratory   Seoul National University
Undergraduate Research Intern (Advisor: Prof. Tae-Woo Lee)   *Jul.2024 – Present*
Topic: Robotic Applications Using Organic Semiconductor Devices
- Fabricating a robotic hand and designing analog circuits to drive the hand using synaptic devices
- Evaluating ITP (ion transfer promoter) addition in PIL electrolyte for ion conduction, retention, and stretchability

Healthcare Robotics Laboratory   Seoul National University
Undergraduate Research Intern (Advisor: Prof. Amy Kyungwon Han)   *Sep.2023 – Jun.2024*
Topic: Development of soft actuators to prevent heart failure and pneumatic soft actuators w/o drivelines
- Designed and authored a bachelor thesis on a pneumatic soft actuator, eliminating drivelines and pumps, utilizing liquid-to-gas phase change material with an origami structure for enhanced 3D motion
- Proposed a soft actuator made of SMA to occlude the superior vena cava and halt venous flow to prevent heart failure

Neuroelectronic Interfaces Research Group (NEI)   RWTH Aachen University, Germany
Undergraduate Research Intern (Advisor: Prof. Francesca Santoro)   *Mar.2023 – Aug.2023*
Topic: Development of microfluidics system for electrodeposition of PEDOT:PSS
- Designed a microfluidics system for the fabrication of PEDOT:PSS film, enabling active adjustment of the ratio between EDOT and PSS during polymerization
- Analyzed the effect of flow rate in the polymerization of PEDOT:PSS and determined the optimal flow rate and molar ratio of EDOT to PSS
- Participated in a seminar discussing organic electrochemical transistor, bioelectronics and neural interfaces

Future Mobility Technology Center   Seoul National University
Undergraduate Research Intern (Advisor: Prof. Kyongsu Yi)   *Dec.2022 – Feb.2023*
Topic: Development of autonomous driving perception model using inputs from LiDAR & camera
- Spearheaded the LiDAR team in generating software for detection and categorization of nearby objects.
- Integrated LiDAR and camera data into a vehicle trajectory prediction model using Kalman filter.
- Generated communication package to send and receive nodes between Python codes without using ROS for

lightweight operating environments
- Classified obstacles using a camera and Yolov5 object detection model.

Soft Robotics & Bionics Laboratory   Seoul National University
Undergraduate Research Intern (Advisor: Prof. Yong-Lae Park)   *Jun.2022 – Nov.2022*
Topic: Development of Soft Inductive Tactile Sensors for Wearable Robotics
- Developed and tested soft tactile sensors incorporating a Hall sensor and neodymium magnet to measure normal and shear stress for a joint research project with KAIST on wearable suit skin stresses
- Investigated the effects of conductive films on soft inductive tactile sensors' flexibility and signal amplification ratio using eddy current effect
- Proposed a new fabrication method for e-Gain film by spraying e-Gain on graphene nanofiber to prevent the island effect for high electrical conductance

AWARDS & COMPETITIONS

Exemplary Teaching assistant Award, Faculty of Liberal education, Seoul National University   *Jun.2024*
- Recognized for exceptional achievement and exemplary dedication as a Python course teaching assistant

Excellence Award, Student internship in department of System Semiconductor Engineering for AI   *Mar.2024*
- Developed an algorithm to remove object and restore background model for application in SLAM algorithm

Best Design Award, Sungkyunkwan University Future Mobility Automated Driving Software Contest   *Feb.2023*
- Participated as the leader of the LiDAR team in the perception department

Outstanding Sports Club Member, The 10th Annual Seoul National University Sports Night   *Dec.2022*
- Hosted by Center for Sport Development & Promotion

Participant, The 2019 Baja KSAE challenge   *Aug.2019*
- Hosted by the Korean Society of Automotive Engineers (KSAE)

TECHNICAL SKILLS

Software
- Python: Proficient in libraries such as OpenCV, PyTorch, Sklearn, and TensorFlow
- SolidWorks: 3D CAD design of mechanical parts, stress-strain analysis of assemblies and simple flow simulation
- MATLAB : Data analysis capabilities, including Finite Element Method (FEM) for thermodynamic and fluid analysis

Hardware
- Raspberry Pi 4, Arduino: Circuit design for robotic applications
- RPLiDAR: Acquirement of point cloud data
- Oscilloscope, Laser cutting, Electric welding, Soldering

CLUB ACTIVITIES

Vice Captain, SNU Swimming Club   *Mar. 2022 – Present*
- Coordinating training schedules and ensuring team members' attendance and participation
- Led the school team in the 1st Gwangju National Masters Swimming Championships, securing 3rd place in the 50m backstroke
- Recognized as an "Outstanding Sports Club Member" and awarded a prize of approximately $1,500 for dedication and leadership.

Cultural Exchange Organization   *Aug. 2023 – Jun. 2024*
- Facilitated the adaptation of foreign exchange students to university life and Korean culture
- Organized activities such as cooking traditional foods, exploring places in Korea, and language exchange

Musical Club   *Sep. 2018 – Sep. 2019*
- Designed the sets for the musicals Bungee Jumping, Laundry, and two gala shows, working closely with directors and actors to ensure smooth production
- Built stages with MDF plywood, wood, and other props made by 3D modeling, laser cutting, welding, etc.

Robotics Club   *Mar. 2018 – Dec. 2018*
- Developed a smartphone controlled power strip with Arduino and Android studios
- Gained foundational knowledge in circuit communication and C programming

ADDITIONAL INFORMATION

Republic of Korea Army (ROK Army)   **Artillery battalion**
Honorary Discharge as a Sergeant, ROK 5th Infantry Division   *Jan. 2020 – Jul. 2021*
- Motor Transport Operator specialist
- Served as squad leader (since *Nov. 2020*) and received awards for exemplary soldier and outstanding trainee

REFERENCES FOR DONGSU CHOI

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