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| **HYUNWOO LEE** | | | | | | | | |
| **Phone** (+65) 8575 2728 | | | **LinkedIn** | | | | | |
| **E-mail** [hyunwoo001@e.ntu.edu.sg](mailto:hyunwoo001@e.ntu.edu.sg) | | | [linkedin.com/in/hyunwoolee0329](https://www.linkedin.com/in/hyunwoolee0329/) | | | | | |
| **Nationality** South Korean | | | **Website** [jadehouse.vercel.app](https://jadehouse.vercel.app/) | | | | | |
| Hyunwoo Lee, a focused and determined mechanical engineering student graduating in 2025 with a strong interest in mechanical engineering, particularly in biomechatronics. Eager to tackle practical problems to make a difference and enhance lives of anyone anywhere. Equipped with academic proficiency and research capability through strong academic standing and numerous research and project experiences. | | | | | | | | |
| **Research Interests** | | | | | | | | |
| * Prosthesis (Neuroprosthesis) * Exoskeletons * Implantable Devices * Artificial Organs * Rehabilitation Devices | | | | | | | | |
| **Education** | | | | | | | | |
| **Bachelor of Engineering in Mechanical Engineering** | | | | | | | **Aug 2020 – May 2025** | |
| Nanyang Technological University – Singapore | | | | | | | | |
| * 4.84 / 5.00 CGPA - First Class Honor (Highest Distinction) * Accelerated Bachelors Program (3.5 years candidature) * Robotics and Mechatronics Stream (Specialization) * Major Prescribed Electives: MA4825 Robotics, MA4822 Measurements and sensing system, MA4830 Realtime software for mechatronics systems, MA4012 Machine Intelligence | | | | | | | | |
| **Research Experience** | | | | | | | | |
| **Assistive Robot Arm Extender (ARAE) Calibration Procedure for Personalized Assistance (**[**Blog**](https://jadehouse.vercel.app/lab/experiences/fyp)**)** | | | | | | | **Jun 2024 – Current** | |
| **Associate Professor Ang Wei Tech** | | | | | | | | |
| Final Year Project, Nanyang Technological University | | | | | | | | |
| * Developing a calibration procedure for ARAE to capture personalized anthropometric data * Utilizing physics-based simulations to validate the calibration process and ensure accurate anthropometric data capture * Testing on human subjects to assess and confirm the effectiveness of personalized assistance | | | | | | | | |
| **SENSE - Surface Electromyography Nerve Symptom Evaluator (**[**Blog**](https://jadehouse.vercel.app/lab/experiences/SENSE)**)** | | | | | **February 2024 – Current** | | | |
| **Mechanical Engineering Undergraduate, Lee Hyunwoo and Lee Yeonjae** | | | | |  | | | |
| Personal Project, Nanyang Technological University and [SingHealth](https://www.singhealth.com.sg/) | | | | | | | | |
| * Developing diagnostic device for disc conditions by detecting nerve compression in lumbar back caused by herniated discs using surface electromyography (sEMG) sensor * Developing sensor hardware and signal transformation and classification software * Cooperating with orthopedic surgeon from SingHealth and NTU professors to collect data from disc patients and expand the project into a potential venture | | | | | | | | |
| **Novel Soft Robotic Implantable Device to Prevent Acute Heart Failure (**[**Blog**](https://jadehouse.vercel.app/lab/experiences/snu)**)** | | | | | | | | **Jun 2024 – Aug 2024** |
| **Assistant Professor Han, Amy Kyungwon** | | | | | | | | |
| Research Assistant, Seoul National University Healthcare Robotics Laboratory (HeRo Lab) | | | | | | | | |
| * Fabricated and tested three different bend sensors and pressure sensors designs to identify the optimal sensor for device design * Developed a sensor-based actuation feedback control system for the soft robotic implantable device * Participated in in-vivo living model animal testing on swine and collected hemodynamic data through catheter operation to evaluate the feasibility and efficacy of the implantable device in preventing acute heart failure | | | | | | | | |
| **Novel Lattice Designs for 3D Printing (**[**Blog**](https://jadehouse.vercel.app/lab/experiences/ureca)**)** | | | | | | | **Aug 2021 – May 2022** | |
| **Assistant Professor Lai Changquan** | | | | | | | | |
| Undergraduate Research Experience on Campus (URECA), Nanyang Technological University | | | | | | | | |
| * Investigated 3x3x3 symmetrical lattices composed of two different types of unit cells with no internal void to obtain novel lattice design with optimal mechanical properties and 3D printing feasibility * Utilized 3D modeling, finite element analysis and optimization to yield optimal lattice structure and optimal unit cell thickness for different lattice structure at specific relative densities | | | | | | | | |
| **Work Experience** | | | | | | | | |
| **Mobile Robotics Intern (**[**Blog**](https://jadehouse.vercel.app/lab/experiences/delta)**)** | | | | **Jan 2024 – May 2024** | | | | |
| Delta Electronics Int'l (Singapore), Singapore | | | | | | | | |
| * Developed an Autonomous Mobile Robot (AMR) solution for elderly care, specialized for delivering medical supplies and necessities * Designed safety sensor systems and programmable logic controllers (PLC) for the AMR, ensuring compliance with international standards * Implemented Visual Simultaneous Localization And Mapping (VSLAM) for AMR operation using lidar and camera technologies * Collaborated with [Lions Befrienders](https://www.lionsbefrienders.org.sg/) to tailor the robot to the needs and difficulties of elders | | | | | | | | |
| **Sergeant, Radar Operator** | | | | | | **Jun 2022 – Dec 2024** | | |
| Capital Defense Command, Republic of Korea Army, Seoul, South Korea | | | | | | | | |
| * Operated low altitude radar and thermal observation device in numerous air defense bases * Served as a Squad Leader (June 2022 - December 2022) | | | | | | | | |
| **Leadership Experience** | | | | | | | | |
| **Heal Heels (**[**Blog**](https://jadehouse.vercel.app/lab/experiences/dyson)**)** | | | | | **Aug 2021 – Dec 2021** | | | |
| **Convertible heels that can transform into flat shoe** | | | | | | | | |
| Product Development Challenge, Dyson-NTU Studio | | | | | | | | |
| * Piloted a team of five from concept generation to product development, culminating in a final product presentation * Demonstrated meticulous planning, decisiveness, and leadership throughout the project * Motivated the team to maintain focus and overcome challenges | | | | | | | | |
| **Cargot** | | | | | **Jan 2022 – May 2022** | | | |
| **Lightweight, durable, and convenient safe for online deliveries** | | | | | | | | |
| Engineering Innovation & Design, NTU | | | | | | | | |
| * Led a team of nine to develop a product idea with market potential into an initial prototype and compiled a business proposal outlining market feasibility * Identified team members' strengths and assigned responsibilities accordingly to maximize their potential * Established active communication between the team and the supervisor to ensure appropriate progression | | | | | | | | |
| **Contactless Mart Delivery Solution (**[**Blog**](https://jadehouse.vercel.app/lab/experiences/martdeliv)**)** | | | | | **Jan 2022 – May 2022** | | | |
| **Autonomous solution for shopping without entering the mart** | | | | | | | | |
| Mechatronics System Design, NTU | | | | | | | | |
| * Directed a team of four to develop a mechatronics solution to address challenges during the pandemic * Demonstrated cooperation and effective communication to collaborate on complex software and hardware development * Coordinated the development workflow to ensure consistency and enhance productivity | | | | | | | | |
| |  |  | | --- | --- | | **Publications & Presentations** | | | **F Jiang, CQ Lai. (2023) Bioinspired Compound Nested Lattices with Programmable Isotropy and Elastic Stiffness Up to Theoretical Limit** | **Co-Author** | | **Feng Jiang, Ian P. Seetoh, Hyunwoo Lee, Guo Yao Lim, Dominic Kang Jueh Lim, Jonathan Singham, Chang Qi, Chang Quan Lai** | | | Composites Part B: Engineering, 2024. [<https://doi.org/10.1016/j.compositesb.2024.111656>] | | | | | | | | | | |
| **Awards and Honors** | | | | | | | | |
| **AY 21/22 Dean’s List** | | **2022** | | | | | | |
| Nanyang Technological University | | | | | | | | |
| **Skills** | | | | | | | | |
| **Programming** | C++, Python, CSS, HTML, JavaScript, React, ROS, Machine Learning | | | | | | | |
| **Software** | CAD, Finite Element Analysis, MuJoCo, VSLAM, GitHub, Docker | | | | | | | |
| **Hardware** | Sensors, Actuators, Circuits, Data Acquisition Systems | | | | | | | |
| **Language** | Korean (native), English (native) | | | | | | | |