Hyeongkeun ‘Hugo’ Kim

Curriculum Vitae

Name	**Hyeongkeun Kim** / 김형근 (金亨瑾)
Date of Birth	**December 27th, 1994**
Nationality	**REPUBLIC OF KOREA (SOUTH KOREA)**
Homepage	**https://engiecat.github.io**
E-mail	**engiecat3.14@gmail.com**

Education

2013.03 - 2020.02(Expected)

B.S.(Expected), Mechanical Engineering (Bio-Brain Engineering as Double Major), KAIST

- Cumulative GPA 3.69/4.3
- Dean’s List in College of Engineering
- Recipient of the Presidential Science Scholarship (2013-2015) (KOSAF, Gov’t of Korea)
- Compulsory civilian service (2017~2019, Changwon Dongbaek School for the students with disabilities)

2015.01 - 2015.07

Exchange Student, Département Génie Mécanique Développement, INSA Lyon, France

- Recipient of the 15th Mirae Asset Student Scholarship for Overseas Exchange Student

2010.02 - 2013.02

Korea Science Academy of KAIST

- Cumulative GPA 3.80/4.30

Research Experiences

2016. 08 - 2017. 02 NAVER Labs Robotics Group, NAVER Corp. (Currently NAVER LABS Corp.)

Full-time Research Intern (Supervisor: Sangok Seok, Ph. D.)

A. TuskBot (Intern Project)

- Designed and optimized a robot platform(TuskBot) that is compatible with most stairs in existence, regardless of their dimensions and morphology (riser and nose) in team
- Achieved mobility in general indoor environment, while maintaining minimal cost.
- The designed platform and the optimization method had been presented in **IROS 2017** as an oral presentation..

B. Autonomous Personal Transporter (In-house Project)

- Designed structural components of the prototype
- Modified algorithm and interface of the control/sensing system of the prototype
- The result had been presented in **UR 2018 (Ubiquitous Robots)** and was awarded the **Best Application Paper Award**.

2016. 06 - 2018. 06 Biomicrofluidics Lab., Department of Mechanical Engineering, KAIST

Undergraduate Student Researcher (Supervisor: Prof. Jessie S. Jeon)

A. Vision Marker-Based In Situ Examination of Bacterial Growth in Liquid Culture Media (2016)

- Developed a simplified and automated system using a camera and a striped pattern marker, which can be used in macroscopic and microscopic environments.
- The system can be applied regardless of the variations in the type of bacterial carrier and vessels ranging from the culture tubes to the microfluidic devices.
- The developed system had been published in **Sensors (Indexed for SCIE)** as a journal article

B. MineLoC: A rapid production of lab-on-a-chip biosensors using 3D printer and the sandbox game, Minecraft (2018)

- Developed a pipeline to generate 3D printable models of master templates ('molds') for Lab-on-a-chip(LoC) biosensors by using a popular sandbox game 'Minecraft' with team members
- Conducted experiments on manufacturing the LoC using the pipeline and analyzed the performance
- The developed pipeline had been published in **Sensors** as a journal article

2013. 10 - 2014. 07 Department of Knowledge Service Engineering, KAIST

Research Assistant (Supervisor: Research Prof. Seongyong Hong)

Participated in the "캠퍼스 CEO 발굴지원사업" (National Grant Project for uncovering future campus CEOs) organized by NIPA(National IT Industry Promotion Agency, Korea).

- "Design and Implementation of Auto Water Robot Module for Plant Care System" (with team members)
- Designed and programmed robot telecommunication system (Robot-PC-Server) and reactive web-based robot control system and aesthetic design of the product.

Participated in the research project for "Swarm Robots based on NXC Program and Experimental for Intelligent Control"

- "Swarm robots based on NXC program and experimental for intelligent control" (with team members)
- Designed and programmed for the remote swarm robot control system based on flexible Master/Slave relationship.

Journal Articles

2018 Kyukwang Kim*, **Hyeongkeun Kim*,** Seunggyu Kim, Jessie S. Jeon, "MineLoC: A Rapid Production of Lab-on-a-Chip Biosensors Using 3D Printer and the Sandbox Game, Minecraft" *Sensors* 18.6 (2018): 1896, doi: 10.3390/s18061896 **(Co-first author, Indexed for SCIE)**

Kyukwang Kim, **Hyeongkeun Kim** and Hyun Myung, "Bio-inspired robot swarm control algorithm for dynamic environment monitoring". *Advances in Robotics Research* 2.1 (2018):1-11 doi: 10.12989/arr.2018.2.1.001

2016 Kyukwang Kim, Duckyu Choi, Hwijoon Lim, **Hyeongkeun Kim**, Jessie S. Jeon, "Vision Marker-Based *In-Situ* Examination of Bacterial Growth in Liquid Culture Media". *Sensors* 16.12 (2016): 2179, doi: 10.3390/s16122179 (Indexed for SCIE)

Kyukwang Kim, **Hyeongkeun Kim,** Hwijoon Lim, Hyun Myung, "A Low Cost/Low Power Open Source Sensor System for Automated Tuberculosis Drug Susceptibility Testing." *Sensors* 16.6 (2016): 942, doi: 10.3390/s16060942 (Indexed for SCIE)

2012 Jooyoung Kim, Sooin Kim, Kyuyoung lee, **Hyeongkeun Kim**, Jaehyuk Jun, Yunjong Jeong, Muchan Kim, Jongrim Lee and Changwoo Lee, "Nano-size Study of Surface-modified Ag Anode for OLEDs", Journal of the Korean Vacuum Society v.21 n.1, January 2012, pp.12~16, doi: 10.5757/JKVS.2012.21.1.12

Conference Publications and Presentations

2018 D. Choi, M. Kim, **H. Kim**, J. Choe, Moses C. Nah, "Motion Planning of Autonomous Personal Transporter Using Model Predictive Control for Minimizing Non-Minimum Phase Behavior" in *15th International Conference on Ubiquitous Robots (UR 2018)*, Honolulu, HI, 2018, pp. 362-368. doi: doi: 10.1109/URAI.2018.8442211 (**Best Application Paper Award**)

2017 J. Choe*, U. Kwon*, M. C. Nah* and **H. Kim***, "'Design Analysis of TuskBot: Universal Stair Climbing 4-Wheel Indoor Robot" in *2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vancouver, 2017, pp. 6908-6914. doi: 10.1109/IROS.2017.8206614 **(Corresponding Author, Co-first Author)**

J. Choe*, M. C. Nah*, **H. Kim*** and U. Kwon*, "'TuskBot': Design of the Mobile Stair Climbing 2 By 2 Wheels Robot Platform with Novel Passive Structure 'Tusk'" *Proc. 2017 3rd International Conference on Control, Automation and Robotics (ICCAR).* IEEE, Apr. 2017, pp. 217-220, doi: 10.1109/ICCAR.2017.7942690 **(Co-First Author)**

U. Kwon, **H. Kim**, M. C. Nah and J. Choe, "Rocker-Bogie with 'Tusk': Design of the mobile robot platform that can climb stairs with Tusk and rocker-bogie mechanism" in *12nd Korea Robotics Society Annual Conference,* Pyeongchang, Rep. of Korea, 2017

2014 Kyukwang Kim, **Hyeongkeun Kim**, Heekun Roh, Hanlim Choi, "Flying BioLab : A CanSat platform for sampling and monitoring air bacteria in bio-hazardous area", 2014 KSAS(Korea Society for Aeronautical & Space Sciences) Fall Conference, Organized Session, pp. 86.

Hyeongkeun Kim, Jieum Hyun, Seonghyeon Jo, Jonghun Cheo, Seongyong Hong, "A Study on the Remote Swarm Robot Control based on Flexible Master/Slave Relationship Algorithm", 2014 Korea Computer Congress(KCC), pp.1701-1703.[ISSN 1598-5164]

Jieum Hyun, **Hyeongkeun Kim**, Seonghyeon Jo, Jonghun Cheo, Seongyong Hong, "A Design and Implementation of Auto Water Robot Module for Plant Care System", 2014 Korea Computer Congress(KCC), pp.1803-1805.[ISSN 1598-5164]

2012 **Hyeongkeun Kim**, Seoyon Park, Juha Park, In-ok Song, "Building H-R Diagram of Star Clusters with DSLR Camera and its Educational Application"(*Korean*: 카메라를 사용한 성단의 H-R도 작성 및 교육적 활용), The Bulletin of the Korean astronomical society, v. 37 no. 2, pp. 96, 2012.

2011 Jooyoung Kim, Sooin Kim, Kyuyoung lee, **Hyeongkeun Kim**, Jaehyuk Jun, Yunjong Jeong, Muchan Kim, Jongrim Lee and Changwoo Lee, "(*Korean*) Nano-indenter를 통한 유기발광소자(OLED)용 Ag전극의 표면처리에 따른 물성변화 연구", Annual conference of the Korean Vacuum Society v. 41, 2011, pp. 224

Teaching and Mentorship Experiences

2015. 09 - 2016. 06 School of Computing, KAIST

Undergraduate Teaching Assistant (CS101 - Fall 2015 and Spring 2016)

Worked as a teaching assistant for 〈CS101 - Introduction to Programming〉 course. The work included lab session assistance, exam grading and office hours

2014. 05 - 2014. 12 Jungni Middle School, Daejeon, South Korea

Extracurricular Class Instructor (Robotics)

Taught basic robotics for middle school students

- 2014. 05 - 08: Taught basic robotics based on RoboRobo© system
- 2014. 09 - Current: Taught intermediate robotics based on Arduino platform.

2014. 03 - 2015. 12 School of Freshman, KAIST

Tutor for Freshman Tutoring Program (Spring 2014 and Fall 2015)

2010. 02 - 2011. 5 Korea Science Academy of KAIST

Student Mentor for International Students (International Student Buddy Program)

Selected Honors and Awards

2018. 06 **Best Application Paper Award**, 2018 15th International Conference on Ubiquitous Robots (UR)

2015. 10 **Creativity Prize (CEO of Intel Korea),** 2015 Intel Edison IoT Contest (Korean: 인텔 에디슨과 함께하는 IoT 경진대회)

2015. 07 **3rd Prize (CEO of SK Hynix),** 2015 Happy Science & Technology Contest (*Korean:* 2015 행복한 과학기술공모전)

2015. 03 **Dean's List (2014 Fall)**, College of Engineering, KAIST

2014. 12 **Grand Prize(1st) in High-tech Medical Service (President of Wonju Biomedical Techno-Valley),** World Embedded Software Contest 2014 (Korean: 제 12회 임베디드 소프트웨어 경진대회)

2014. 11 **Grand Prize(1st) (President of Samsung SDS),** Samsung SDS S/W Club Championship

2014. 09 **2nd Prize (President of KAIST),** Korea CanSat Competition 2014 (Korean: 2014 캔위성경연대회)

2013. 11 **Honorary Mention for Excellent Idea (the head of Korea Institute of Next Generation Computing)** Korea Wearable Computer Contest 2013

2013. 08 **Special Award (Commissioner of Korean Intellectual Property Office),** Korea STEAM Competition 2013 (Korean: 2013 융합과학(STEAM) 창작 경진대회)

2013. 02 **Merits for Research and Scholarship (Korea Science Academy of KAIST)**

2012. 09 **Grand Prize(1st) (Minster of Education, Science and Technology, Gov't of Korea),** Korea CanSat Competition 2012 (Korean: 2012 캔위성경연대회)

Notable Grants and Scholarships

2018. 11 - 2019. 05 **2018/2019 PyTorch Scolarship Challenge with Facebook** (Udacity) - Accepted for Scholarship

2015. 02 - 2015. 08 **15th Mirae Asset Student Scholarship for Overseas Exchange Students ($5,300)**

2014. 07 - 2014. 12 **Grant for Supporting Sci/Tech University Student Clubs ($3,500)**
(*Korean:* 이공계대학생 과학기술동아리 지원사업, Korean Federation of Sci. and Tech. Societies*)*
Project: "Development of Standard BioLab System for CanSats", Club MR (Microrobot Research)

2013. 09 - 2014. 06 **National Grant Project for Uncovering Future Campus CEOs ($44,000)**
(*Korean:* 캠퍼스 CEO 발굴지원사업, National IT Industry Promotion Agency)
Project: "Design and Implementation of Auto Water Robot Module for Plant Care System"

2013. 06 - 2013. 12 **2013 National Science Convergence Grant ($4,400)**
(*Korean: 2013 과학융합지원사업, 청년 과학융합/창업 아이디어 창출활동 지원,* KOFAC)
Project: "Project NeoPLaNet - Smartphone App Development for Legal-Counseling Platform"

2013. 02 - 2015. 02 Presidential Science Scholarship (KOSAF, Gov't of Korea) ($2,200 per semester and Full Tuition)

Leadership Experiences

Robotics

Participating in the Robotics Club in KAIST **(MR - Microrobot Research)** (2013.3 - Current)

- **Joint Founder** of Team **W5.KAIST**, that seeks seamless integration of robotics in biology research.
  - **Automatic detection system for microbes in biohazard area ('14)**
    The work had been awarded **2nd prize** in Korea CanSat Competition 2014 and presented in **2014 KSAS Fall Conference** as an oral presentation.
    The derivative work (for aquaponics factories) had been awarded **Grand Prize** in 2014 Samsung SDS S/W Club Championship
    The derivative work (Vision-marker based detection system) had been published in **Sensors** journal as an article.
  - **A low-cost automatic diagnostic system for Tuberculosis drug susceptibility test ('14 - '16)**
    The work had been awarded **Grand Prize in High-tech Medical Service** in 12th World Embedded Software Contest, and presented in **2014 Intel Korea Year-End Press Conference**.
    The work had been also published in **Sensors** journal as an article
  - **Automatic tracking robot for bacterial contamination in biohazard area ('14 - '15)**
    The work had been awarded **3rd prize** in 2015 Happy Science & Technology Contest, and published in **Advances in Robotics Research** journal as an article.

Joint Founder of **UAV/CanSat Research Club** in Korea Science Academy of KAIST (2012.2 - 2013.2)

Deep-Learning

2018/2019 PyTorch Challenge with Facebook (Udacity)

- **Student Leader** in #live-help
  - Assisted students with Python and basic CUDA/PyTorch
  - Participated as Study Jam volunteer and #sg-korea study group online meetup
  - **Accepted for scholarship (Phase 2)**

Compulsory Civilian Service

Changwon Dongbaek School for Students with Disabilities (창원동백학교)

- **Lead Social Service Agent**
  - Assisted Students with severe cerebral palsy, brain lesion and autism
  - Led and coordinated other social service agents as a lead agent (2018.5 - 2019.3)
  - Awarded **commendation** from Military Manpower Administration Social Service Training Center

Language

Foreign Language	Examination	Grade	Organizing body
English	TOEFL	107 (B2)	ETS
English	GRE	V166/Q169/W4.0	ETS