

Hyeongkeun 'Hugo' Kim

Curriculum Vitae

Name **Hyeongkeun Kim / 김형근 (金亨瑾)**
Date of Birth **December 27th, 1994**
Nationality **REPUBLIC OF KOREA (SOUTH KOREA)**
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Education

2013.03 - 2020.02(Expected)

B.S.(Expected), Mechanical Engineering, KAIST (Korea Advanced Institute of Science and Technology)

- Cumulative GPA 3.69/4.3
- Dean's List in College of Engineering
- Recipient of the Presidential Science Scholarship (2013-2015) (Gov't of Korea, KOSAF)

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) with team members.
- Achieved mobility in general indoor environment, while maintaining minimal cost.
- 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 applications 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

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| 2018 | <p>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" <i>Sensors</i> 18.6 (2018): 1896, doi: 10.3390/s18061896 (Co-first author, Indexed for SCIE)</p> <p>Kyukwang Kim, Hyeongkeun Kim and Hyun Myung, "Bio-inspired robot swarm control algorithm for dynamic environment monitoring". <i>Advances in Robotics Research</i> 2.1 (2018):1-11 doi: 10.12989/arr.2018.2.1.001</p> |
| 2016 | <p>Kyukwang Kim, Duckyu Choi, Hwijoon Lim, Hyeongkeun Kim, Jessie S. Jeon, "Vision Marker-Based In-Situ Examination of Bacterial Growth in Liquid Culture Media". <i>Sensors</i> 16.12 (2016): 2179, doi: 10.3390/s16122179 (Indexed for SCIE)</p> <p>Kyukwang Kim, Hyeongkeun Kim, Hwijoon Lim, Hyun Myung, "A Low Cost/Low Power Open Source Sensor System for Automated Tuberculosis Drug Susceptibility Testing." <i>Sensors</i> 16.6 (2016): 942, doi: 10.3390/s16060942 (Indexed for SCIE)</p> |

- 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, USA, 2018 (**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

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.

Participated in **UAV & CanSat Research Club** in Korea Science Academy of KAIST (2012.2 - 2013.2)

Freethought

Participating in the Freethought Club in KAIST (Freethinkers KAIST) (2013.3 - Current)

- **Head of Academic Affairs / Vice-president** (2014)
 - Successfully coordinated campaigns for the regular membership of KAIST Clubs Union, which is required for financial grants and club room application.
 - Led International cooperation with freethought groups abroad.
Organized affiliation with CFI(Center for Inquiry) on Campus.

Language

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