

# Hyeongkeun 'Hugh' Kim

Curriculum Vitae

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

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**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 15<sup>th</sup> 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

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

**Full-time Research Internship** (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.

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

**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.

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

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

**Research Assistant** (Supervisor: Research Prof. Seongyong Hong)

A. 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.

B. 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.

## Academic Publications

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**2018**

Kyukwang Kim\*, **Hyeongkeun Kim\***, Hwijoon Lim, Hyun Myung, "MineLoC: A Rapid Production of Lab-on-a-Chip Biosensors Using 3D Printer and the Sandbox Game, Minecraft" *Sensors* 18.6 (2018): 1896. **(Co-first author, SCIE IF 2.5)**

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)**

- 2018 cont.** 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
- 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
- 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. (**SCIE IF 2.5**)
- 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. (**SCIE IF 2.5**)
- 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.
- 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, <http://dx.doi.org/10.5757/JKVS.2012.21.1.12>
- 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 Experience

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**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<sup>®</sup> 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)

## Extracurricular Experiences

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**2014. 09 - 11** Participated in National Science Museum <4<sup>th</sup> National Science Museum Idea Club> (Korean: 국립중앙과학관 무한상상실 아이디어클럽(4기))>

("Development of Health-care Shoes", Team ShoeMaker)

**2014. 08 - 11** Participated in <Samsung SDS S/W Club Championship> (**Grand Prize**)

(Club MR (KAIST), "Diagnostic system for auto-detecting microbes in Aquaponics factories with Data Acquisition, Storage and Visualization system")

**2014. 07 - 12** Participated in <2014 Project for Supporting Sci/Tech University Clubs. (Korean: 이공계 대학생 과학기술동아리 지원 사업)>

("Development of Standard BioLab System for CanSats", Club MR (KAIST))

**2014. 06 - 11** Participated in Korea Wearable Computer Contest 2014 (**Honorable Mention**)

("Development of Self-Tightening Health-Care Shoes") (Team ShoeMaker)

**2014. 05 - 12** Participated in the <World Embedded Software Contest 2014>

(High-tech Medical Service **Grand Prize**, 'BioLab-MYCO, an auto-diagnostic system for detecting *Mycobacterium Tuberculosis*')

**2013. 10 - 14. 07** Participated in the <National Grant Project for uncovering future campus CEOs (Korean: 캠퍼스 CEO 발굴지원사업)> organized by NIPA (National IT Industry Promotion Agency, Korea).

**2013. 08** Participated in ICISTS-KAIST 2013 (International Conference for the Integration of Science, Technology and Society)

**2013. 04 - 12** Recipient of the 2013 National Youth Science Convergence/Startup Grant (Korean: 2013 청년 과학융합/창업 아이디어 창출활동 지원) organized by KOFAC (Korea Foundation for the Advancement of Science & Creativity)

("Project "NEO People-LAW NETwork")

**2013. 03 - 11** Participated in the E\*5-KAIST (Startup Incubation Project)

("Smartphone Application Development for legal counseling platform")

**2012. 06 - 07** Completed internship in the Laboratory of Biomedical Mechanics & Materials (LBMM) in the Department of Bioengineering, National University of Singapore. (“An Instrumented Tissue Tester for Determining the Relationship between Ageing Effect and Plantar Soft Tissue Stiffness”).

## Awards

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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 (IDEA), College of Engineering, KAIST

2014. 12 Grand Prize(1<sup>st</sup>) 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(1<sup>st</sup>)(President of Samsung SDS), Samsung SDS S/W Club Championship

2014. 11 Honorary Mention(the head of Korea Institute of Next Generation Computing), Wearable Computer Contest 2014

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

2014. 06 Honorary Mention(Korean Institute of Information Scientists and Engineers), Korea Computer Congress(KCC 2014) Undergraduate/High School Paper Competition

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 1<sup>st</sup> Prize(Minster, Ministry of Education, Science and Technology), Korea CanSat Competition 2012 (*Korean*: 2012 캔위성경연대회)

## Grants and Fellowships

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2015. 02 Recipient of the 15<sup>th</sup> Mirae Asset Student Scholarship for Overseas Exchange Student (\$6,000)

2013. 02 **Recipient of the Presidential Science Scholarship (KOSAF)** (\$2,500 and tuition per semester)

## Language

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Foreign Language	Examination	Grade	Organizing body
English	TOEFL	107(B2)	ETS
English	GRE	V166/Q169/W4.0	ETS
French	-	A2	INSA Lyon FLE

## Other Qualifications or Skills

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<b>Technical Skill</b>	Basic knowledge in SolidWorks, AutoCAD and MATLAB
<b>Information Skill</b>	Expert level of computer usage. Programming: Python, C#, C++, Java, Android, Arduino(Processing), Javascript Basic skills in Server management and maintenance. Intermediate Skills in Microsoft Office Word and Excel, Adobe Photoshop and AfterEffect Advanced Skills in Microsoft PowerPoint

## Interests & Hobbies

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<b>Robotics</b>	Participating in the Robotics Club in KAIST (MR - Microrobot Research) (2013.3 - Current) Participated in UAV & CanSat Research Club in Korea Science Academy of KAIST (2012.2 - 2013.2)
<b>Freethought</b>	Participating in the Freethought Club in KAIST (Freethinkers KAIST (affiliate of CFI on Campus)) (2013.3 - Current) <ul style="list-style-type: none"><li>- Head of Academic Affairs (2014)</li></ul>