

HANEOL SKY KIM

Senior Software Engineer, Samsung Healthcare

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Skill Overview

Experiences in medical image processing, 3D rendering, and artificial intelligence
Proficient in various programming languages and algorithm
Excellence in problem solving and rapid prototyping
Strong interests in disability, rehabilitation, and physical therapy

Education

Gwangju Institute of Science and Technology

Gwangju, Korea

M.S. in School of Mechanical Engineering

2011

Distributed Control and Autonomous Systems Laboratory (DCAS Lab)

Thesis: Multiagent Cooperative Reinforcement Learning: Convergence Proofs and Applications

Advisor: Professor Hyo-Sung Ahn (hyosung@gist.ac.kr)

University of Seoul

Seoul, Korea

B.S. in Electrical and Computer Engineering and Physics

2009

Experience

Samsung Healthcare

Seoul, Korea

Senior Software Engineer

2013 – present

- Doing the state-of-the-art research related to medical image processing and digital healthcare
- Developed advanced 3D rendering algorithm such as direct volume rendering, physically based rendering, 3D segmentation and its visualization for Radiology and Obstetrics & Gynecology
- Proposed deep learning projects using object detection, semantic segmentation, and style transfer
- Proposed web-based application using image streaming and responsive web UI
- Developed Cortex M based embedded system, FFT signal processing algorithm, and device driver
- Developed UI automated testing tool, 3D data manipulation tool, and productivity tools in Python
- Reviewed regulatory affairs documentation for FDA510(k)
- Participated in clinical research with many hospitals and medical institutions
- US Patents: 4 Grant, 1 Application

Seoul National University

Seoul, Korea

Lead Software Engineer

2011 – 2012

- Developed programming and numeric computing platforms (CEMTool, CEMStudio)
- Developed a compiler and toolboxes compatible with MATLAB (CEMTool)
- Developed a GUI simulator of model-based control system like LabVIEW (CEMStudio)
- Proposed control system applications such as cloud based CLI service and drone flight simulator
- Lead a software team of 5 people
- Advisor: Emeritus Professor Wook-hyun Kwon (whkwon@snu.ac.kr)

Gwangju Institute of Science and Technology

Researcher

Participated in bio-insect project applying reinforcement learning algorithm for robot-insect interaction

Seoul, Korea

2009 – 2011

Korea Institute of Science and Technology

Intern

Designed the embedded system for phosphorescent detection

Seoul, Korea

2005 – 2006

Hackathon

Leader and Software Engineer

- VOMI: Virtual reality (VR) device and image processing application for low vision 2015
 - Eye-Stick: Image-to-Speech system for legal blindness using CNN-based image classification model 2016
 - NUKEYMED: CNN-based diagnostic tool for glaucoma detection using fundus images of the eye 2016
 - BULO: Respiratory rehabilitation device for lung disease and pulmonary complications 2017
- * Winner for Creative Lab Competition at Samsung Electronics*

Seoul, Korea

Private Research

REGO Research

- Rego Blog: Providing the leading articles for neurological diseases (spinal cord injury and stroke) 2019 – present
<https://regoresearch.github.io/> 2020
 - regogym: Low-cost rehabilitation training service with BLE sensor and 3D exercise models
<http://regogym.com> 2021
- * Grand Prize for SCI Contents Competition at Korea Spinal Cord Injury Association (KSCIA)*
- myWater: Health management app of water intake and excretion for urinary tract infection (UTI) 2022
<https://play.google.com/store/apps/details?id=com.rego.mywater>
- * Grand Prize for SCI Contents Competition at Korea Spinal Cord Injury Association (KSCIA)*

Korea

pcFRAME

- Provided a tutorial for basic PC assembly service with self-made videos and a QnA service 2002 – 2012

Korea

Publications

- Doory Kim, **Han-Eol Kim**, Chang-Hong Kim, " Enhancement of Long-Persistent Phosphorescence by Solid-State Reaction and Mixing of Spectrally Different Phosphors", ACS Omega, 2020
- Doory Kim, **Han-Eol Kim**, Chang-Hong Kim, "Development of a Blue Emitting Calcium-Aluminate Phosphor", PLoS ONE, 2016
- Doory Kim, **Han-Eol Kim**, Chang-Hong Kim, "Effect of Composition and Impurities on the Phosphorescence of Green-emitting Alkaline Earth Aluminate Phosphor", PLoS ONE, 2016
- **Han-Eol Kim**, Bong-hee Seo, Kwang-jin Kim, "CEMStudio: model-based simulation software for general-purpose signal processing", KMMS 2012, Seoul, Korea (**Best Award Paper*)
- **Han-Eol Kim**, Huy Bien, Kwang-Jin Kim, Jun-Ha Kim, "seaHERO: Modeling and Simulation Software for Seawater Desalination Plant", 4th International Desalination Workshop 2011, Jeju, Korea
- Young Wook Kwon, **Han-Eol Kim**, Wook-hyun Kwon, Soohye Han, "Golf swing simulation using a double inverted pendulum", IEIE 2011, Jeju, Korea
- **Han-Eol Kim**, M.S. Thesis, "Multiagent Cooperative Reinforcement Learning: Convergence Proofs and Applications", School of Information and Mechatronics, Gwangju Institute of Science and Technology, 2011.
- **Han-Eol Kim**, Hyo-sung Ahn, "Convergence of Multiagent Q-Learning: Multi Action Replay Process Approach", IEEE ISIC 2010, Yokohama, Japan
- **Han-Eol Kim**, Hyo-sung Ahn, "Multi-agent cooperative reinforcement learning for heterogeneous mobile robots", ICMIT 2009, Gwangju, Korea
- **Han-Eol Kim**, Hyo-sung Ahn, "A review on Q-Learning convergence theorem", KACC 2009, Busan, Korea
- **Han-Eol Kim**, Doory Kim, Chang-Hong Kim, "Energy Transfer between Two Phosphorescent Phosphors", Korean Chemical Society 2007, Daegu, Korea

Patents

- **Han-eol Kim**, Ultrasound diagnosis apparatus and method of displaying ultrasound image, December 10, 2019, US Patent 10499881, **Grant**.
- **Han-eol Kim**, Ultrasound diagnosis apparatus and method of operating the same, October 15, 2019, US Patent 10441249, **Grant**.
- **Han-eol Kim**, Dong-hoon Oh, Ultrasound diagnosis apparatus and method, September 10, 2019, US Patent 10405832, **Grant**.
- Dong-Yoon Park, **Han Eol Kim**, Dong Hoon Oh, Dong Gyu Hyun, Input apparatus and medical image apparatus comprising the same, January 29, 2019, US Patent 10191632, **Grant**
- Nam Du JEON, **Han Eol KIM**, Dong Gyu HYUN, WIRELESS ULTRASONIC PROBE AND ULTRASONIC APPARATUS HAVING THE SAME, July 14, 2016, US Patent 20160199028, Application
- **Han-Eol Kim**, Chang-hong Kim, Doory Kim, "Enhancement of long persistent phosphorescence by chemical mixing of two or more phosphorescent phosphors with spectral overlap", KR Patent 2020090009795, Application
- Doory Kim, Chang-hong Kim, **Han-Eol Kim**, "Fluorescent lamp with phosphorescent mold cover", KR Patent 10-2006-0071858, Application

Honors and Awards

2022	Best Reviewer Certificate	Samsung Research
2021	Professional SW Certificate	Samsung Research
2021	Grand Prize , SCI Contents Competition	Korea Spinal Cord Injury Association
2020	Grand Prize , SCI Contents Competition	Korea Spinal Cord Injury Association
2020	Instructor Certificate , Disability Awareness in the Workplace	Korea Employment Agency
2019	Instructor Certificate , Human Rights and Philanthropy	Center for Disability Rights
2017	Winner , Creative Lab (C-Lab) Competition	Samsung
2017	Very Good Grade , Employee Evaluation	Samsung Healthcare
2016	Best Idea , Samsung 7th Bluehack Hackathon	Samsung Healthcare
2015	Silver Medal , Creative Idea Contest	Samsung Healthcare
2014	Excellent Grade , Employee Evaluation	Samsung Healthcare
2011	Best Paper Award , Oral Session	Korea Multi-Media Society
2010	Bronze Medal , GIST Science Camp	GIST
2009 – 2011	Government Full Scholarship	GIST
2005 – 2008	Seoul Citizen and Academic Full Scholarship	University of Seoul

Teaching Experience

2010	GIST Science Camp (Instructor)	Gwangju, Korea
2019 – present	Instructor of Human Rights and Disability >25 lectures for government offices, companies, schools, and the public applicants	Seongnam, Korea

Skills

- Programming Language C, C++, C#, Python, MFC, Delphi, Xamarin
- 3D Rendering DirectX (HLSL), Unity
- Firmware Programming ARM, AVR, CCS
- Microcontroller ARM Cortex M3 (CC2650)/M4 (TM4C123), AVR (ATmega16, ATmega128)
- Web Programming HTML5, JavaScript, PHP, NodeJS, VueJS, Firebase
- Medical Image Processing OpenCV, numpy, VTK, ITK, dcmk, ImageJ, DICOM, ITK-SNAP
- Simulation Tool MATLAB, Simulink, LabVIEW
- Artificial Intelligence Caffe, TensorFlow, Keras, scikit-learn, numpy
- Operating System Windows, Linux