

Professional Experience

Postdoctoral Research Fellow (2019-present)

Seoul National University [Soft Robotics & Bionics Lab](#) advised by Yong-Lae Park

- This three-year research position replaces actual military duty in South Korea.
- Developing several soft/flexible actuators and structures based on pneumatic, electromagnetic, and electrostatic forces and cellular composites.
- Leading a working group of 20 researchers to write a review paper about proprioceptive soft actuators.

Graduate Research Assistant (2015-2019)

Stanford University [SHAPE Lab](#) advised by Sean Follmer

- Devised energy-dissipative mechanisms, such as braking, clutching, and pneumatic jamming, for lightweight and power-efficient wearable haptic interfaces.
- Investigated vibrotactile and multimodal haptic feedback to provide additional pseudo kinesthetic sensations.
- Led multidisciplinary team collaboration with researchers at MIT Media Lab, Facebook Reality Labs, and Google Research, and Hyundai Motor Company.
- Won several awards in top HCI conferences and filed six patents.

Research Intern (Summer 2017)

Microsoft Research [EPIC Group](#)

- System architecture, hardware development, and user evaluation of a multifunctional VR haptic controller. The work has been published to a top HCI conference and patented.

Research Intern (Summer 2015)

Hansen Medical, Inc. [Robotics Group](#)

- Devised new active guidewire manipulation mechanisms for the Sensei robotic catheter system. Filed a patent.

Graduate Research Assistant (2014-2015)

Stanford University [AI Lab](#) advised by Oussama Khatib

- Implemented macro-mini force control with the hybrid actuation system of pneumatic artificial muscles and electrical dc motors.

Selected Publications

Augmenting Perceived Softness of Haptic Proxy Objects through Transient Vibration and Visuo-Haptic Illusion in Virtual Reality [\[TVCG '21\]](#)

Inrak Choi, Yiwei Zhao, Eric Gonzalez, Sean Follmer

CLAW: A Multifunctional Handheld Haptic Controller for Grasping, Touching, and Triggering in Virtual Reality [\[CHI '18\]](#)

Inrak Choi, Eyal Ofek, Hrvoje Benko, Mike Sinclair, Christian Holz

Grabity: A Wearable Haptic Interface for Simulating Weight and Grasping in Virtual Reality [\[UIST '17\]](#)

Inrak Choi, Heather Culbertson, Mark Miller, Alex Olwal, Sean Follmer

Wolverine: A Wearable Haptic Interface for Grasping in Virtual Reality [\[IROS '16\]](#)

Inrak Choi, Elliot Hawkes, David Christensen, Chris Ploch, Sean Follmer

A Soft, Controllable, High Force Density Linear Brake Utilizing Layer Jamming [\[RAL '18\]](#)

Inrak Choi, Nick Corson, Lizzie Peiros, Elliot Hawkes, Sean Keller, Sean Follmer

Selected Patents

Controller with haptic feedback [\[US Patent 10,617,942\]](#)

Christian Holz, Eyal Ofek, Mike Sinclair, Hrvoje Benko, Inrak Choi, Eric Whitmire

Active drive for guidewire manipulation [\[US Patent 11,241,559\]](#)

Inrak Choi, June Park, Arkady Kokish

Input device and vehicle including the same, and method of controlling input device [\[US Patent App. 16/991,539\]](#)

Seunghwan Lee, Inrak Choi, Sean Follmer

Education

Stanford University

PhD in Mechanical Engineering

[Thesis: Handheld Haptic Feedback for Grasping in Virtual Reality](#)

2016-2019

Stanford University

MS in Mechanical Engineering

Robotics, Dynamics, Haptics

2013-2016

Korea University

BS in Mechanical Engineering

2009-2013

Skills

Hardware Design

RP, CAD (mainly SolidWorks), haptic interface and robot design, soft actuator and stretchable sensor design including fabrication

Simulation & Modelling

simulation (COMSOL, MATLAB) and theoretical modelling of pneumatic / electrostatic / electromagnetic actuators and flexible composite structures

Mechatronics

circuits, PCB (mainly Altium), low-level control, actuators/sensors

User study design

quantitative & qualitative methods, statistical analysis

Programming

C++, MATLAB

Selected Awards

Best Paper Award x2

UIST 2016, 2017

Best Demo Award

UIST 2016

Distinguished Paper Award

IMWUT 2018

Presidential Science Scholarship

Korea

Teaching Experience

All grad-level courses at Stanford

Dynamic Systems, Vibrations

and Control; Advanced

Dynamics & Computation;

Advanced Dynamics, Simulation & Control

with Paul Mitiguy

Experimental Robotics;

Introduction to Robotics

with Oussama Khatib