

# Hyung-gun Chi

MASTER STUDENT

108 S. River Road, West Lafayette, IN, 47906

☎ 415-203-8543 | ✉ chi45@purdue.edu | 🌐 <https://hyung-gun.me> | 📱 stnoah1 | 📺 hyung-gun

## Research Interests

- 3D Geometric Deep Learning
- Robotics
- Smart Manufacturing

## Education

### Purdue University

MASTER OF SCIENCE IN MECHANICAL ENGINEERING

West Lafayette, IN, USA

Aug. 2018 - PRESENT

- Advisor: Prof. Karthik Ramani, Donald W. Feddersen Professor of Mechanical Engineering

### Yonsei University

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Seoul, S. Korea

Mar. 2010 - Feb. 2017

- Advisor: Prof. Soo-Hong Lee, Associate Professor of Mechanical Engineering
- 2011-2013, 2-year military service

## Research Experience

### Engineering Shape Benchmark (ESB)

West Lafayette, IN

GRADUATE ASSISTANT, C-DESIGN LAB

Jan. 2019 - Present

- Collected Engineering shape using scrapper and expanded the data with parameterized CAD model to build a database
- Developed Creo Parametric and SolidWorks Python API for data expansion.

### Latent Transformation Neural Network (LTNN)

West Lafayette, IN

GRADUATE ASSISTANT, C-DESIGN LAB

Aug. 2018 - Present

- Developed a fully-convolutional conditional generative model which is capable of view synthesis using a light-weight neural network suited for real-time applications.

### Interventional Generative Network (IGN)

West Lafayette, IN

GRADUATE ASSISTANT, C-DESIGN LAB

Aug. 2018 - Present

- Developed the GAN model which generate 3D objects given a discrete category condition and continuous instance-level attributes.

### Visual Programming Language for Mobile Robots and IoT Nodes (VIPO)

West Lafayette, IN

GRADUATE ASSISTANT, C-DESIGN LAB

Aug. 2018 - Present

- Proposed a web-based visual and spatial programming language that allows novice users and small industries to program mobile robots and IoT Nodes to execute planned tasks

### ControllAR

West Lafayette, IN

GRADUATE ASSISTANT, C-DESIGN LAB

Aug. 2018 - Dec. 2018

- Proposed a parametrizing interface, simple and accessible fabrication workflow with no soldering or sewing involved, and a pressure sensor using a soft piezoresistive elastomer material.

### 3D Object Classification Model Evaluation

Seoul, S. Korea

RESEARCH ASSISTANT, KNOWLEDGE-BASED DESIGN LAB

Feb. 2016 - Jul. 2017

- Proposed a method which evaluate 3D neural network models using the visualization based on the decomposition of a model's predictions to apply the models in the field of mechanical design and manufacturing.

### Module Structure Platform for Surgical Workflow Management

Seoul, S. Korea

RESEARCH ASSISTANT, KNOWLEDGE-BASED DESIGN LAB

Feb - Jul. 2016

- Developed a web-based platform for integrated surgical information, to optimize surgical procedures and reduce medical loss caused by communication errors and lack of information.

## Skills

**Programming** Python, C/C++, JavaScript, HTML, CSS, PHP, Matlab, SQL

**Frameworks** ROS, TensorFlow, Keras, Caffe

**Software** Creo Parametric, SolidWorks, AutoCAD, HyperWorks

**Languages** Korean, English

## Publications

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### Conferences Papers

- S. Kim, **H. G. Chi** and Karthik Ramani. "FuseNet:Fusing surface and volumetric representations for 3D Shape Synthesis and Analysis" (2019) *International Conference on Computer Vision (ICCV)*, submitted.

### Journal Papers

- S. Kim, N. Winovich, **H. G. Chi**, G. Lin and Karthik Ramani. "Latent Transformations Neural Network for Object View Synthesis" (2019) *The Visual Computer*, submitted.
- L.Paredes, X. Qian, **H. G. Chi** and Karthik Ramani. "ControllAR: Design and Fabrication of a Universal Parametric Low-Profile Hand Wearable for Augmented Reality Interactions" (2019) *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, under revision.
- H. T. Hwang, **H. G. Chi**, N. K. Kang, H. B. Kong and Soo-Hong Lee. "An Evaluation Methodology for 3D Deep Neural Network using Visualization in 3D Data Classification" (2018) *Journal of Mechanical Science and Technology (JMST)*, accepted.

## Patents

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- H. G. Chi. "Computer Input Automation System" KR Patent (2017): 10-1745330

## Working Experience

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### NEIL LAB Corporation

Seoul, S. Korea

CO-FOUNDER & PYTHON DEVELOPER

Sep. 2016 - Aug. 2017

- Automated an office platform for a tax office to enhance the office's work efficiency and customer service
- Developed a RPA system, using Python, to increase the efficiency of working in the office
- Led and managed the company with more than 20 employees as the CEO and selected as a startup funded by the Seongnam Industry Promotion Agency (fund amount: \$ 30,000)

### Republic of Korea Army

Inje, S. Korea

SERGEANT & SQUAD LEADER

Apr. 2011 - Jan. 2013

- In charge of the maintenance of firearms, wireless devices, vehicles, and NBC equipment
- Led a squad as the squad leader; honored as a distinguished soldier

## Extracurricular Activity

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### Habitat for Humanity Korea Campus Chapter

S. Korea

MEMBER & PRESIDENT

Mar. 2010 - Aug. 2016

- Constructed houses for the homeless and worked on improving poor residential environments, during 26 and 7 occasions, respectively
- Led and managed the volunteer group for a year; received the first honor from 2014 Yonsei Club Evaluation

### Korea Food for the Hungry International - campus volunteer group

S. Korea

MEMBER

Apr. 2013 - Nov. 2013

- Taught and mentored preschool children and elementary school students at Seoul Children's Center

## Honors & Awards

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| 2016 | <b>KISTI (Korea Institute of Science and Technology Information) President's Award,</b><br>Edison Challenge - Computer Aided Design Section            | Seoul, S. Korea   |
| 2016 | <b>CDE (Society for Computational Design and Engineering) President's Award,</b> CDE<br>Challenge - Computational Design and Engineering Tools Section | Daejeon, S. Korea |