

# Dongha Chung

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## EDUCATION

**Korea Advanced Institute of Science and Technology**, Yuseong-gu, Daejeon, Republic of Korea

- Ph.D. candidate in Mechanical Engineering Aug 2017 –
  - Adviser: Prof. Jinwhan Kim
  - Focus: Autonomous underwater vehicle(AUV), Computer Vision, SLAM
- M.S. in Mechanical Engineering Aug 2015 – Aug 2017
  - Adviser: Prof. Jinwhan Kim
  - Thesis: Stereo Vision Based Pose Estimation Relative to Planar Surface towards Underwater Ship Hull Inspection
  - Focus: Autonomous underwater vehicle(AUV), Computer Vision, Stereo Vision
  - Cumulative GPA: 3.45 / 4.30
- B.S. in Mechanical Engineering Feb 2009 – Aug 2015
  - Cumulative GPA: 3.25 / 4.30

## RESEARCH EXPERIENCE

**Mobile Robotics & Intelligence Laboratory**, KAIST, Graduate researcher

- Control of underwater vehicle
  - Domestic conference [4]
  - Development of an autonomous ship-hull inspection system, Ministry of Oceans and Fisheries
  - A Study on the Path Planning/Following and Obstacle Avoidance for Autonomus Underwater Vehicle, Agency for Defense Development
- Underwater computer vision
  - Domestic conference[2,3,4,5], International conference[1,2,3], Domestic Journals[1], International Journals[1]
  - Development of an autonomous ship-hull inspection system, Ministry of Oceans and Fisheries

## PROFESSIONAL AFFILIATIONS & ACTIVITIES

**Seoul Robotics**, Gangnam-gu, Seoul, Republic of Korea

- Robotic Perception Engineer, Research Team, Jan 2019 – Jan 2020
  - Development of ground detection algorithm using LiDAR for autonomous vehicle.
  - Development of lane detection algorithm using LiDAR for autonomous vehicle [Demo]
  - Development of pedestrian classification algorithm using LiDAR
  - Development of pedestrian tracking algorithm using LiDAR [Demo]

## SKILLS

Programming Languages: C++, Matlab, Python

## PUBLICATIONS

(\* corresponding author)

### INTERNATIONAL JOURNALS

- [1] S. Hong, D. Chung, J. Kim\*, Y. Kim, A. Kim and H. Yoon, "In-water visual ship hull inspection using a hover-capable underwater vehicle with stereo vision," *Journal of Field Robotics*, vol. 36, no. 3, pp. 531-546, May 2019.

### DOMESTIC JOURNALS

- [1] J. Park, D. Chung, J. Kim\*, "자율 수중 작업 및 선체 검사 자동화를 위한 AUV 기술," *The Society of Naval Architects of Korea*, vol. 57, issue 3, pp. 7-11, Sep 2020.

### INTERNATIONAL CONFERENCES

- [3] D. Chung and J. Kim\*, "Pose Estimation Considering an Uncertainty Model of Stereo Vision for In-Water Ship Hull Inspection," in *Proceedings of 11<sup>th</sup> IFAC Conference on Control Applications in Marine Systems (CAMS)*, Opatija, Croatia, Sep 2018.
- [2] S. Hong, D. Chung, and J. Kim\*, "Development of a Hover-Capable AUV System for Automated Visual Ship-Hull Inspection and Mapping," in *Proceedings of MTS/IEEE OCEANS*, Anchorage, USA, Sep 2017.
- [1] D. Chung, S. Hong, and J. Kim\*, "Underwater Pose Estimation Relative to Planar Hull Surface Using Stereo Vision," in *Proceedings of IEEE/OES International Symposium on Underwater Technology(UT)*, Busan, Republic of Korea, Feb 2017.

### DOMESTIC CONFERENCES

	<ul style="list-style-type: none"> <li>[5] D. Chung, S. Hong, and J. Kim*, “Underwater 3D Reconstruction of Curved Surfaces using Smoothness Constraints” in <i>Proceedings of the 15th Korea Robotics Society Annual Conference</i>, Gangwon-do, Republic of Korea, May 2021.</li> <li>[4] D. Chung, S. Hong, and J. Kim*, “Relative Pose Estimation based on Stereo Vision System Toward Ship Hull for Hull Relative Navigation,” in <i>Proceedings of the 13th Korea Robotics Society Annual Conference</i>, Gangwon-do, Republic of Korea, Jan 2018.</li> <li>[3] S. Hong, D. Chung, J. Kim*, C. Jung, S. Ahn, and J. Lee, “Development of an Autonomous Underwater Ship Hull Inspection System and Its Preliminary Test,” in <i>Proceedings of the Korean Association of Ocean Science and Technology Societies, Joint Conference</i>, Busan, Republic of Korea, Apr 2017.</li> <li>[2] D. Chung, S. Hong, and J. Kim*, “Surface Normal Estimation Using Stereo Vision For Hull-Relative Navigation of an Underwater Robot,” in <i>Proceedings of the 12th Korea Robotics Society Annual Conference</i>, Gangwon-do, Republic of Korea, Feb 2017.</li> <li>[1] (Outstanding student paper presentation award) D. Chung and J. Kim*, “Attitude Control of an Unmanned Underwater Vehicle using Quaternion Feedback,” in <i>Proceedings of the Korean Association of Ocean Science and Technology Societies, Joint Conference</i>, Busan, Republic of Korea, May 2016.</li> </ul>
<b>PATENTS</b>	<ul style="list-style-type: none"> <li>[3] D. Chung, H. Truong, T. Jonsson, J. Park, Y. Kim ”VEHICLE AND METHOD FOR DETECTING LANE,” 10-2255924-0000. May 2021.</li> <li>[2] J. Park, H. Lee, D. Chung, H. Truong ”VEHICLE AND METHOD FOR GENERATING MAP CORRESPONDING TO THREE-DIMENTIONAL SPACE,” 10-2238522-0000. Apr 2021.</li> <li>[1] J. Kim, J. Park, S. Hong, D. Chung, ”NORMAL VECTOR EXTRACTION APPARATUS AND METHOD THEREOF BASED ON STEREO VISION FOR HULL UNDERWATER INSPECTION USING UNDERWATER ROBOT,” 10-1923581-0000. Nov 2018.</li> </ul>
<b>AWARDS</b>	<ul style="list-style-type: none"> <li>■ Second award in ”LG Mobile Projector Marketing Idea Contest” Aug 2009</li> <li>■ Outstanding student paper presentation award (Domestic conference [1]) Nov 2016</li> </ul>
<b>OTHER WORK EXPERIENCE</b>	<p><b>Teaching Assistnace</b>, Department of mechanical engineering, KAIST</p> <ul style="list-style-type: none"> <li>■ <b>ME401</b> Capstone design Fall semester, 2018</li> <li>■ <b>ME490</b> Programming for autonomous mobile system Fall semester, 2018</li> <li>■ <b>ME652</b> Mobile robotics Spring semester, 2018</li> <li>■ <b>ME251</b> Dynamics Fall semester, 2017</li> </ul> <p><b>Republic of Korea Marine Corps.</b>, Pohang, Gyeongsangbuk-do, Republic of Korea</p> <ul style="list-style-type: none"> <li>■ Sergeant, 72<sup>nd</sup> battalion May 2011 – Feb 2013</li> </ul>
<b>LANGUAGES</b>	<ul style="list-style-type: none"> <li>■ Korean: Native language.</li> <li>■ English: Upper-Intermediate. <ul style="list-style-type: none"> <li>● TOEIC 920 - Dec 2017</li> </ul> </li> </ul>