

# **2017 14th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI 2017)**

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# Technical Program

## June 29 (Thu)

09:00-10:30 **[TA1]** Invited Talk 1 + Humanoid & Legged Robots

**Convention Hall A (1F)**

Chair: Kyoungchul Kong (Sogang Univ., Korea)  
Co-Chair: Jaeheung Park (Seoul Nat'l Univ., Korea)

**TA1-1** 09:00-09:30

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Paul Oh  
*UNLV, USA*

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Minh Nhat Vu<sup>1,2</sup>, Jongwoo Lee<sup>1</sup> and Yonghwan Oh<sup>1,2</sup>  
*<sup>1</sup>Korea Institute of Science and Technology(KIST), Seoul, Korea, <sup>2</sup>University of Science and Technology(UST), Korea*

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*<sup>1</sup>The University of Tokyo, Japan, <sup>2</sup>University of Nevada, USA*

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*<sup>1</sup>Japan Advanced Institute of Science and Technology, Japan, <sup>2</sup>Thammasat University, Thailand*

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<sup>1</sup>The George Washington University, USA, <sup>2</sup>Michigan Technological University, USA,  
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<sup>1</sup>Michigan Technological University, USA, <sup>2</sup>The George Washington University, USA, <sup>3</sup>Japan University, USA
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Co-Chair: Cecilia Laschi (Scuola Superiore Sant'Anna, Pisa, Italy)

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Co-Chair: Joo-Haeng Lee (ETRI, Korea)

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<sup>1</sup>*Korea Institute of Science and Technology, Korea*, <sup>2</sup>*University of Science and Technology, Korea*

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<sup>1</sup>*Chinese Academy of Science, China*, <sup>2</sup>*Shenzhen institutes of Advanced Technology, China*,  
<sup>3</sup>*Shaanxi University of Science & Technology, China*, <sup>4</sup>*Hanyang University, Korea*
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Co-Chair: Tan Tien Nguyen (Hochiminh City Univ. of Tech., Vietnam)

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*Korea Institute of Science and Technology, Korea*

## Technical Program

June 30 (Fri)

09:00-10:30 **[FA1]** Invited Talk 4 + Navigation

**Convention Hall A (1F)**

Chair: Gao Rui (Nat'l Univ. of Singapore, Singapore)  
Co-Chair: Jinwhan Kim (KAIST, Korea)

- FA1-1** 09:00-09:30  
**[Invited Talk 4]** 3D perception for Robotics in Large-scale Structure Manufacturing.....N/A  
Jing Xu  
*Tsinghua Univ., China*
- FA1-2** 09:30-09:45  
**Towards Accurate Kidnap Resolution Through Deep Learning.....502**  
Kent Sommer, Keonhee Kim, Youngji Kim, Sungho Jo  
*KAIST, Korea*
- FA1-3** 09:45-10:00  
**Navigation and Mapping for Visual Inspection of Underwater Structures using an AUV.....N/A**  
Seonghun Hong, Dongha Chung, and Jinwhan Kim  
*KAIST, Korea*
- FA1-4** 10:00-10:15  
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Gao Rui and Mandar Chitre  
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- FA1-5** 10:15-10:30  
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Louis W. Rogowski, Hoyeon Kim, Xiao Zhang, Samuel Sheckman, Daehee Kim, and Min Jun Kim  
*Southern Methodist University, USA*

09:00-10:30 **[FA2]** Disaster Response Robot Technology

**Jade Hall (2F)**

Chair: Jin-ho Suh (KIRO, Korea)  
Co-Chair: Hyun Myung (KAIST, Korea)

- FA2-1** 09:00-09:15  
**Fog Degree Measurement based on Local Contrast and Color Similarity.....517**  
Geun-min Lee, Wonha Kim  
*Kyunghee University, Korea*
- FA2-2** 09:15-09:30  
**A Study on the Disaster Response Scenarios using Robot Technology.....520**  
Oh SeungSub, Hahm Jehun, Jang Hyunjung, Lee Soyeon, Suh Jinho  
*Korea Institute of Robot & Convergence, Korea*
- FA2-3** 09:30-09:45  
**Diachronic Visualization Simulation for Disaster Accident Management Using Robotic System.....524**  
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*Korea Electronics Technology Institute (KETI), Korea*



- FA2-4** 09:45-10:00  
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*Electronics and Telecommunications Research Institute (ETRI), Korea*
- FA2-5** 10:00-10:15  
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*University of Ulsan, Korea*

09:00-10:15 **[FA3]** Medical Robots

**Amethyst Hall (2F)**

Chair: Chunwoo Kim (KIST, Korea)  
Co-Chair: W. Jong Yoon (Univ. of Washington, USA)

- FA3-1** 09:00-09:15  
**On the Use of General-purpose Serial-link Manipulators in Eye Surgery.....540**  
Yushiro Tomiki, Murilo M. Marinho, Yusuke Kurose, Kanako Harada, and Mamoru Mitsuishi  
*The University of Tokyo, Japan*
- FA3-2** 09:15-09:30  
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*Korea University of Technology and Education (KOREATECH), Korea*
- FA3-3** 09:30-09:45  
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*<sup>1</sup>University of Science and Technology, Korea, <sup>2</sup>Korea Institute of Science and Technology, Korea*
- FA3-4** 09:45-10:00  
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*<sup>1</sup>Keystar Intelligence Robot Co., Ltd., China, <sup>2</sup>Qatar University, Qatar, <sup>3</sup>University of Washington, USA*

13:00-14:30 **[FB1]** Invited Talk 5 + Teleoperated Systems

**Convention Hall A (1F)**

Chair: Kuniaki Kawabata (Japan Atomic Energy Agency, Japan)

Co-Chair: Jeakweon Han (Hanyang Univ., Korea)

- FB1-1** 13:00-13:30  
**[Invited Talk 5] Culturally Competent Robots for Elderly Care.....N/A**  
Nak Young Chong  
*JAIST, Japan*
- FB1-2** 13:30-13:45  
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*University of Nevada Las Vegas, USA*
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*Naraha Remote Technology Development Center, Japan*
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*Hanyang University, Korea*
- FB1-5** 14:15-14:30  
**Utilizing the Android Robot Controller for Robots, Wearable Apps, and the Hotel Room of the Future.....570**  
Daniel M. Lofaro  
*George Mason University, USA*

13:00-14:30 **[FB2]** Rehabilitation Robotics

**Jade Hall (2F)**

Chair: Hyung-soon Park (KAIST, Korea)

Co-Chair: Won-Kyung Song (Nat'l Rehabilitation Center, Korea)

- FB2-1** 13:00-13:15  
**Gait pattern analysis using an end-effector type rehabilitation robot and a wearable inertial measurement unit.....576**  
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*National Rehabilitation Center, Korea*
- FB2-2** 13:15-13:30  
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*UNIST, Korea*
- FB2-3** 13:30-13:45  
**Improvement of Upper Extremity Rehabilitation Robotic Exoskeleton, NREX.....580**  
Won-Kyung Song and Jun-Yong Song  
*National Rehabilitation Center, Korea*
- FB2-4** 13:45-14:00  
**On Limb Multi-Joint/DOF Mechanical Impedance Estimation toward Clinical Use.....N/A**  
Sang Hoon Kang<sup>1,2</sup> and Hyun Kyeong Jo<sup>1</sup>  
<sup>1</sup>UNIST, Korea, <sup>2</sup>Northwestern University, United States

- FB2-5** 14:00-14:15  
**Development of Shoulder Rehabilitation Robot for Natural Shoulder Movement.....N/A**  
Hyung-Soon Park, Kyoung-Soub Lee and Jeong-Ho Park  
*KAIST, Korea*
- FB2-6** 14:15-14:30  
**Towards Subject-Specific Lower Limb Smart Robotic Intervention: Features, Efficacies, and Translation into Clinical Studies.....N/A**  
Song Joo Lee  
*KIST, Korea*

13:00-14:30 **[FB3] Non-invasive Medical Systems** **Amethyst Hall (2F)**

Chair: Deukhee Lee (KIST, Korea)

Co-Chair: Norihiro Koizumi (The Univ. of Electro-Communications, Japan)

- FB3-1** 13:00-13:15  
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<sup>1</sup>Korea Institute of Science and Technology, Korea, <sup>2</sup>Korea University of Science and Technology, Korea
- FB3-2** 13:15-13:30  
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*KIMM, Korea*
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<sup>1</sup>The University of Electro-Communications, Japan, <sup>2</sup>National Institute of Advanced Industrial Science and Technology, Japan, <sup>3</sup>Yokohama City University Medical Center, Japan, <sup>4</sup>The University of Tokyo, Japan
- FB3-4** 13:45-14:00  
**A Study for Tracking Focal Lesions in Non-invasive Ultrasound Theragnostic System.....589**  
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<sup>1</sup>The University of Electro-Communications, Japan, <sup>2</sup>The University of Tokyo, Japan, <sup>3</sup>The National Institute of Advanced Industrial Science and Technology, Japan
- FB3-5** 14:00-14:15  
**Design and Experimental Evaluations of Robot-assisted Tele-echography System for Remote Ultrasound Imaging.....592**  
Joonho Seo, Jang Ho Cho, Juyoung Cha, Changwon Kim, Ohwon Kwon  
*Korea Institute of Machinery and Materials, Korea*
- FB3-6** 14:15-14:30  
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<sup>1</sup>Korea Institute of Machinery and Materials, Korea, <sup>2</sup>Johns Hopkins University, USA

15:50-17:20 **[FC1]** Invited Talk 6 + Actuator Mechanism

**Crystal Hall (2F)**

Chair: Hyungpil Moon (SKKU, Korea)  
Co-Chair: Byung-Ju Yi (Hanyang Univ., Korea)

- FC1-1** 15:50-16:20  
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Joo-Ho Lee  
*Ritsumeikan University, Japan*
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<sup>1</sup>*Korea Institute of Science and Technology, Korea*, <sup>2</sup>*Korea University, Korea*
- FC1-3** 16:35-16:50  
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<sup>1</sup>*University of Science & Technology, Korea*, <sup>2</sup>*Korea Institute of Science and Technology, Korea*,  
<sup>3</sup>*Korea Institute of Science and Technology, Korea*
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*Hanyang University, Korea*

15:50-17:35 **[FC2]** Microrobots for Future Medical Treatments & Mobile Robots

**Jade Hall (2F)**

Chair: Hongsoo Choi (DGIST, Korea)  
Co-Chair: Co-Chair: Sehoon Oh (DGIST, Korea)

- FC2-1** 15:50-16:05  
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*Seoul National University, Korea*
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*DGIST, Korea*
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*DGIST, Korea*
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*Sogang University, Korea*

- FC2-5** 16:50-17:05  
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*Osaka University, Japan*
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Jaesub Shin, MinHo Lee, Sun-Young Kang, HyeonSeok Jang  
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