DAHYUN KANG

RESEARCH INTERESTS

Human-Robot Interaction; Interaction Design of Social Robots; Interaction Design of Telepresence Robots; Intelligent Product Design

EDUCATION

Ph.D., Department of Industrial Design, **Ewha Womans University**, 2016-2019

M.A., Department of Industrial Design, Ewha Womans University, 2014-2016

B.A., Department of Industrial Design and **Consumer Science, Ewha Womans University**, 2008-2013

EMPLOYMENT

Commissioned Researcher, 2018.3.-Present
Center for Intelligent & Interactive Robotics, KIST

Research Assistant, 2016, 2017
Department of Industrial Design, Ewha Womans University

Internship, 2013
Economic Research Laboratory, Kyunghyang Media Group

HONORS & AWARDS

A.1 **3rd Prize**, The 10th IEEE International Conference on Social Robotics (ICSR 2018), Competition Session, Qingdao, China, 2018

A.2 **Best Demonstration Nomination**, The 12th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2017), Demonstration Session, Vienna, Austria, 2017.

A.3 **Best Late Breaking Report Nomination**, The 12th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2017), Late-Breaking Report, Vienna, Austria, 2017.

A.4 **Best Interactive Session Award**, The 25th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2016), Poster Session, New York, USA, 2016.

PUBLICATIONS

JI. INTERNATIONAL JOURNAL ARTICLES

JI.1 **D. Kang**, Y. Kim (2018) Color Maketh Robot: Classification of Roles for Robots According to Colors, International Journal of Control and Automation, Vol. 11, No. 5, pp. 193-200 doi: 10.14257/ijca.2018.11.5.17
[SCOPUS Indexed]

JI.2 **D. Kang**, MG Kim, S. S. Kwak (2017) Positive and Negative Reinforcement Strategy for Behavior Inducement Type Intelligent Product, Information, vol. 20, no. 11, pp8109-8115.

[SCOPUS Indexed]

JI.3 **H. Kang**, H. Lee, MG Kim, S. S. Kwak (2016) The Effect of Intelligent Product Types on Users' Perception According to Usage Contexts, International Journal of Software Engineering and Its Applications, vol.10, no.7, pp. 81-92. doi: 10.14257/ijseia.2016.10.7.08.
[SCOPUS Indexed]

JI.4 H. Lee, **H. Kang**, MG Kim, J. Lee, S. S. Kwak (2016) Pepper or Roomba? Effective Robot Design Type Based on Cultural Analysis between Korean and Japanese Users, International Journal of Software Engineering and Its Applications, vol.10, no. 8, pp. 37-46. doi: 10.14257/ijseia.2016.10.8.04.
[SCOPUS Indexed]

JD. DOMESTIC JOURNAL ARTICLES

JD.1 SK Kim, G. W. Kim, **D. Kang**, S. S. Kwak (2018) Users' Perception based on Engagement Strategies of a Social Robot in a Conversation, Design Convergence Study, Vol.17, no.5, pp. 1-15, doi: 10.31678/SDC.72.1

JD.2 **D. Kang**, S. S. Kwak (2017) Evaluating Impressions of Robots According to the Robot's Embodiment Level and Response Speed, Design Convergence Study, vol.16, no.6, pp.153 - 167.

JD.3 **H. Kang**, J. J. Choi, S. S. Kwak (2015) The Effect of Synchronized Movements of a Telepresence Robot with Sender's Movements on the Presence of a Sender and Enjoyment of Interaction, Archives of Design Research (ADR), vol.28, no.3, pp. 119-129.

CI. INTERNATIONAL CONFERENCES

CI.1 **D. Kang**, S. S. Kwak, H. Lee, E. H. Kim, & J. Choi (2020). This or That: The Effect of Robot's Deictic Expression on User's Perception. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020), Oral Presentation*, Las Vegas, NV, USA.

CI.2 S. S. Kwak, JS Kim, B. J. Moon, **D. Kang**, & J. Choi (2020). Robots Versus Speakers: What Type of Central Smart Home Interface Consumers Prefer?.In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2020), Oral Presentation*, Las Vegas, NV, USA.

CI.3 B. J. Moon, S. S. Kwak, D. Kang, H. Lee, & J Choi (2020). The Effects of Internet of Robotic Things on In-home Social Family Relationships. In *Proceedings of 29th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN 2020), Oral Presentation*, Naples, Italy, doi: 10.1109/RO-MAN47096.2020.9223345

CI.4 H. Lee, **D. Kang**, S. S. Kwak, & J. Choi (2020). Designing Robotic Cabinets That Assist Users' Tidying Behaviors. In *Proceedings of 29th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN 2020), Oral Presentation*, Naples, Italy, doi: 10.1109/RO-MAN47096.2020.9223550

CI.1 J. S. Kim, S. S. Kwak, **D. Kang**, & J. Choi (2020). What's in a Name? Effects of Category Labels on the Consumers' Acceptance of Robotic Products. In *Proceedings of the 15th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2020)*, *Oral Presentation,* Cambridge, UK, doi: 10.1145/3319502.3374799.

CI.2 **D. Kang**, S. S. Kwak, H. Lee & J. Choi (2020). First Things First: A Survey Exploring Key

Services and Functions of a Robot. In *Proceedings of the 15th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2020)*, *Late-Breaking Abstracts,* Cambridge, UK, doi: 10.1145/3371382.3378317.

CI.3 S. S. Kwak, **D. Kang**, H. Lee & J. Choi (2020). TapeBot: Modular Robotic Kit for Creating an Interactive Environment. In *Proceedings of the 15th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2020)*, *Demonstration Session,* Cambridge, UK, doi: 10.1145/3371382.3378200.

CI.4 **D. Kang**, S. Kim, S. S. Kwak (2018). The Effects of the Physical Contact in the Functional Intimate Distance on User's Acceptance toward Robots. In *Proceedings of the 13th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2018)*, *Late-Breaking Abstracts,* Chicago, IL, USA, doi: 10.1145/3173386.3177023.

CI.5 **D. Kang**, MG Kim, S. S. Kwak (2017) The Effects of the Robot's Information Delivery Types on Users' Perception toward the Robot, In *Proceedings of the 26th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2017)*, *Oral Presentation,* Lisbon, Portugal, doi: 10.1109/ROMAN.2017.8172467.

CI.6 **D. Kang**, S. S. Kwak (2017) Feel Me If You Can: The Effect of Robot Types and Robot's Tactility Types on Users' Perception toward a Robot, In *Proceedings of the 12th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2017), Late-Breaking Abstracts,* Vienna, Austria, doi: 10.1145/3029798.3038371.
Best Late Breaking Report Nomination

CI.7 S. S. Kwak, **D. Kang** (2017) FacePartBot: The Interactive Face Components, In *Proceedings of the 12th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2017), Demonstration Session,* Vienna, Austria, doi: 10.1145/3029798.3036659.
Best Demonstration Nomination

CI.8 J. J. Choi, **H. Kang**, S. Song, J. S. Yun, S. S. Kwak (2016) How Much Do I Look Like a Human?: The Impact of the Response Types on People's Perception of a Robot, In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016), Late-Breaking Abstracts*, Daejeon, Korea.

CI.9 **H. Kang**, MG Kim, S. S. Kwak (2016) How Much Should I Be Intelligent?: The Impact of Autonomy Level of Intelligent Product, In *Proceedings of the 25TH IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2016), Poster Session*, New York, USA.
Best Interactive Session Award

CI.10 S. S. Kwak, **H. Kang**, H, Lee, C. Wu (2016) PaperBot: The intelligent paper toy, In *Proceedings of 11th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2016)*, *Demonstration Session,* Christchurch, New Zealand, doi: 10.1109/HRI.2016.7451851.

T. THESES

T.1 **D. Kang** (2019) Designing Tactility of Social Robots for User Acceptance. *Ewha W. University Ph.D. Thesis*.

T.2 **D. Kang** (2016) The Effect of Interaction Design Types of Intelligent Products on User's Perception. *Ewha W. University Master's Thesis*.

P. PATENT

P.1 S. S. Kwak, **D. Kang**, H. Kim, J. Kim (2016) Smart Educational Tool Kit Using Paper Folding, Electric Module Kit for The Same, and Method of Making Article Using The same, Korea Patent 10-2016-0092943

W. INTERNATIONAL WORKSHOPS

W.1 **D. Kang** (2019) HRI Pioneers Workshop 2019, ACM/IEEE International Conference on Human-Robot Interaction (HRI2019), Daegu, Korea.

W.2 **D. Kang**, J. Choi (2018) sHRI Strategies to Attract Children's Attention toward a Robot Based on Their Extroversion, ACM/IEEE International Conference of Social Robot (ICSR 2018), Qingdao, China.

W.3 **D. Kang**, S. Kim, S. S. Kwak (2018) Social Human-Robot Interaction Design Toolkit, ACM/IEEE International Conference on Human-Robot Interaction (HRI 2018), Chicago, IL, USA.

W.4 S. Kim, **D. Kang**, G. W. Kim, S. S. Kwak (2017) Verbal and Nonverbal Greetings as a Unit of Social Interaction between Human and Robot, International Conference of Social Robot (ICSR 2017), Tsukuba, Japan.

W.5 **H. Kang**, J. Y. Lee, M. G. Kim, S. S. Kwak (2015) The Effect of Synchronized Movement of the Tele-presence Robot on User's Perception, Humanoids, Seoul, Korea

PROJECTS

R. RESEARCH PROJECTS

R.1 **Development of helper robot for digital homecare**

Korea Institute of Science and Technology
Role: Researcher
Period: 2019. 10. 1 – present

Goal: Discovery of robot services for the elderly

- Analyzed commercialized assistive robots and robot services to identify an assistive robot's role as companions in the home environment
- Investigated user perception of Assistive Robot
- Analyzed and grasped the service that people would like to received help mostly among the services that the robot can provide in the home
- Developed service scenarios considering the robot's contribution to the three service areas (cleaning service, laundry service, and cooking service)

R.2 **Development of Social Robot Intelligence for Social Human-Robot Interaction of Service Robots**

Ministry of Trade, Industry and Energy
Role: Project Manager, Planner (Service Robot's Interaction Design Part), Researcher & Designer
Period: 2017. 4. 1 – Present

Goal: Suggestion of robot design guidelines for development of communication model

- Conducted a qualitative survey for the elderly and welfare workers at the Seongbuk Senior Welfare Center in order to bridge the digital divide among the elderly
- Discovered social cues related to information transfer with the elderly through literature

review in sociology and psychology
- Constructed and conducted a quantitative experiment comparing strategies to deliver information to the elderly based on the results of qualitative and literature surveys
- Developed human-robot interaction design guidelines for information delivery models

R.3 **Development of Emotionally Interactive Home Robot Design for Single Household**

Ministry of Trade, Industry and Energy
Role: Project Manager, Researcher & Designer
Period: 2014. 11. 1 – 2017. 10. 31

Goal: Voice user interface design and hardware design improvement at close-to-production phase.

- Find out on the social, economic, and psychological characteristics of various types of single-person households through literature review and in-depth interview
- Explored social robot design elements by dividing them into appearance, sound, and movement
- Designed HRI to help that a robot interacts with a human in natural, social and effective way by applying social cues that have been used in sociology and psychology to the robot.

R.4 **Development of Home Social Robot's Appearance and Interaction Design for Single Household**

National Research Foundation of Korea
Role: Project Manager, Researcher & Designer
Period: 2016. 10. 24 – 2017. 7. 31

Goal: Development of robot design for solving social isolation of single-person households

- Researched and analyzes usage patterns of smartphones in single person households based on product ecology methodology
- Outlined key constructs of social robot's appearance and interaction design based on the results of the usage patterns of smartphones
- Implemented extracted design elements on social robot and investigate consumer's acceptance of the designed social robot by conducting an experiment
- Proposed design guidelines of a social robot for single household

R.5 **A Study on User-centered Robotic Product Design**

Naver Corporation
Role: Researcher & Designer
Period: 2016. 5. 1 – 2016. 8. 31

Goal: Exploring robotic products acceptable in the market

- Examined the robot industry for benchmarking business models
- Identified issues in daily life, ideated ideal robots, and incarnated robot's appearances with potential user who were familiar with the high-tech gadget
- Derived user needs and design requirements for robot products

R.6 **Origami Bot**
Korea Foundation for the Advancement of Science and Creativity
Role: Researcher & Designer
Period: 2015. 6. 29 – 2015. 12. 31

Goal: Development of Smart educational tool kit using paper folding

- Designed three types of PaperBots and paper assembly kits - Bear, Crocodile, Parrot
- Developed scale mock-ups and interactive prototypes

- Worked cross-functionally with design, engineering, and project management

PROFESSIONAL SERVICE

ACADEMIC ORGANIZATION

Design Chair

ACM/IEEE International Conference on Human-Robot Interaction (HRI2020), Cambridge, UK.

Design Chair

ACM/IEEE International Conference on Human-Robot Interaction (HRI2019), Daegu, Korea.

REVIEWER

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018, 2016

IEEE International Conference on Robot and Human Interactive Communication (RO-MAN), 2016, 2017, 2018, 2019, 2020