DAHYUN KANG

Ph.D. / HRI Researcher

RESEARCH INTERESTS

Human-Robot Interaction; Interaction Design of Social Robots; Interaction Design of Telepresence Robots; Robotic 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

Post-Doc. Researcher, 2019.3.-Present
Center for Intelligent & Interactive Robotics, KIST

Commissioned Researcher, 2018.3.-2019.2
Center for Intelligent & Interactive Robotics, KIST

HONORS & AWARDS

A.1 **Innovative Prototype,** The 16th International Conference on Social Robotics (ICSR 2024), Robot Design Competition, Odense, Denmark, 2024.

A.2 **ARI Best Researcher Award,** AI & Robotics Institute, Korea Institute of Science and Technology (KIST), Seoul, South Korea, 2023.

A.3 **Robot Service Category,** 2023 Robot World, Gyeonggi, Korea, 2023.

A.4 **1st Prize in Hardware Category,** The 14th International Conference on Social Robotics (ICSR 2022), Robot Design Competition, Florence, Italy, 2022.

A.5 **Best Demonstration Award,** The 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2022), Demonstration Session, Sapporo, Japan, 2022.

A.6 **ARI Best Researcher Award,** AI & Robotics Institute, Korea Institute of Science and Technology (KIST), Seoul, South Korea, 2021.

A.7 **Best Paper Candidate,** The 29th IEEE International Symposium on Robot and Human Interactive Communication (IEEE RO-MAN 2020), Oral Session, Naples, Italy., 2020.

A.8 **3rd Prize,** The 10th IEEE International Conference on Social Robotics (ICSR 2018), Competition Session, Qingdao, China, 2018

A.9 **Best Demonstration Nomination**, The 12th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2017), Demonstration Session, Vienna, Austria, 2017.

A.10 **Best Late Breaking Report Nomination**, The 12th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2017), Late-Breaking Report, Vienna, Austria, 2017.

A.11 **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**, C. Nam, S. S. Kwak (2023) Robot Feedback Design for Response Delay, International Journal of Social Robotics. Doi: 10.1007/s12369-023-01068-z.
[SCI Indexed]

JI.2 **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.3 **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.4 **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.5 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**, H. Hwang, & S. S. Kwak (2024). CollaBot: A Robotic System That Assists Library Users Through Collaboration Between Robots. In *Proceedings of the 19th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2024), Oral Presentation,* Boulder, CO, USA.

CI.2 **D. Kang**, S. Kim, J. Choi, & S. S. Kwak (2023). The Effects of Socio-relational Context and Robotization on Human Group. In *Proceedings of the 32nd IEEE International Conference on Robot & Human Interactive Communication (RO-MAN2023), Oral Presentation,* Busan, Korea.

CI.3 S. Shin, **D. Kang**, & S. S. Kwak (2023). Is a robot trustworthy enough to delegate your control?. In *Proceedings of the 32nd IEEE International Conference on Robot & Human Interactive Communication (RO-MAN2023), Oral Presentation,* Busan, Korea.

CI.4 J. S. Kim, S. Shin, **D. Kang**, Y. Lim, & S. S. Kwak (2023). Connecting without reaching: How voice cloning can be used for robots to enhance mental health of isolated people during a pandemic. In *Proceedings of the 32nd IEEE International Conference on Robot & Human Interactive Communication (RO-MAN2023), Oral Presentation,* Busan, Korea.

CI.5 **D. Kang**, J. Choi, & S. S. Kwak (2022). Exploring ICT for the Elderly: By Analyzing the Elders' Needs for Information Acquisition and Delivery. In *Proceedings of the 31st IEEE International Conference on Robot & Human Interactive*

Communication (RO-MAN2022), Oral Presentation, Naples, Italy.

Cᵢ.6 J. S. Kim, **D. Kang**, J. Choi, & S. S. Kwak (2022). Domestic Social Robots as Companions or Assistants? The Effects of the Robot Positioning on the Consumer Purchase Intentions. In *Proceedings of the 31st IEEE International Conference on Robot & Human Interactive Communication (RO-MAN2022), Oral Presentation,* Naples, Italy.

Cᵢ.7 S. Kim, **D. Kang**, J. Choi, & S. S. Kwak (2022). Who's on First? The Impact of the Proactive Interaction on User Acceptance of the Robotized Object. In *Proceedings of the 31st IEEE International Conference on Robot & Human Interactive Communication (RO-MAN2022), Oral Presentation,* Naples, Italy.

Cᵢ.8 S. S. Kwak, S. Park, **D. Kang**, H. Lee, J. H. Yang, Y. Lim, & K. Song (2022). PopupBot, a Robotic Pop-up Space for Children: Origami-based Transformable Robotic Playhouse Recognizing Children's Intention. In *Proceedings of the 2022 ACM/IEEE International Conference on Human-Robot Interaction*, *Demonstration Session,* Sapporo, Japan, doi: 10.5555/3523760.3523972.
Best Demonstration Award

Cᵢ.9 S. Shin, **D. Kang**, & S. S. Kwak (2022). User-centered Exploration of Robot Design for Hospitals in COVID-19 Pandemic. In *Proceedings of the 2022 ACM/IEEE International Conference on Human-Robot Interaction*, *Late-Breaking Abstracts,* Sapporo, Japan, doi: 10.5555/3523760.3523931.

Cᵢ.10 H. Lee, **D. Kang**, J. Choi, & S. S. Kwak, (2021). Effect of AI Agent's Speech and Tactility Types on Users' Perception. In *2021 30th IEEE International Conference on Robot & Human Interactive Communication (RO-MAN2021)*, *Oral Presentation,* Naples, Italy, doi: 10.1109/RO-MAN50785.2021.9515471.

Cᵢ.11 **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, doi: 10.1109/IROS45743.2020.9341067.

Cᵢ.12 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, doi: 10.1109/IROS45743.2020.9341748.

Cᵢ.13 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
Best Paper Nomination

Cᵢ.14 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.15 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.16 **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.17 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.18 **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.19 **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.20 **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

C.21 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

C.22 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.

C.23 **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

C.24 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.0 S. S. Kwak, KG. Kim, S. Kim, JS Kim, W. Lee, J. Choi, & **D. Kang** (2022). Disinfection Robot.
Korean Design Patent Registration Number: 30-1153080-0000.

P.1 S. S. Kwak, KG. Kim, S. Kim, JS Kim, W. Lee, J. Choi, & **D. Kang** (2022). Disinfection Robot.
Korean Design Patent Registration Number: 30-1153080-0000.

P.2 S. S. Kwak, J. Choi, **D. Kang**, & H. Lee (2020). Creative Education TapeBot Interacting with Masking Tapes.
Korean Patent Number: 10-2020-0089889

P.3 S. S. Kwak, J. Choi, **D. Kang**, & H. Lee (2020). Coding Robot.
Korean Design Patent Registration Number: 30-2020-0049371.

P.4 S. S. Kwak, J. Choi, **D. Kang**, & H. Lee (2020). Masking Tapes for Coding.
Korean Design Patent Registration Number: 30-2020-0049372.

P.5 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 Number: 10-2016-0092943.

W. INTERNATIONAL WORKSHOPS

W.1 **D. Kang** (2019) The effect of tactility and socio-relational context on social presence and user satisfaction, 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

E. EXHIBITION

E.1 **CollaBot**, 2024 Consumer Electronic Show (CES), Las Vegas, NV, USA.

E.2 **CollaBot**, 2023 Robot World, Gyeonggi, Korea.

E.3 **PaperBot**, 2015 Korea Maker Festival, Seoul, Korea.

PROJECTS

R. RESEARCH PROJECTS

R.1 Ministry of Trade, Industry and Energy
Development of a Collaborative Care Robot System and Multimodal Human-Robot Interaction Services for Supporting Daily Activities of Infants and Toddlers
Role: Project Manager, UX Researcher
Period: 2024.04.01 – Present

Developed HRI Design Guidelines:
- Prioritized key services for infants and toddlers, including emotional care, safety care, daily care, and learning support.
- Defined essential robotic functions and HRI design elements for social robots (e.g., gaze direction, turning motions) and physical assistance robots (e.g., hand-over gestures, movement paths).

Designed Robotic Devices for Customized Data Collection:
- Identified critical data requirements for personalized care services (e.g., eating habits).
- Conceptualized robotic devices (e.g., robotic meal trays) to enhance data acquisition and support individualized care.

R.2 Korea Institute of Science and Technology
Multi-Robot Autonomous Navigation Intelligence
Role: UX Researcher
Period: 2023.01.01 – 2024.12.31

Explored Strategies for Multi-Robot Environments:
- Designed interaction and service frameworks for heterogeneous robotic products (e.g., robotic desk and chair).
- Developed collaborative strategies enabling robots to provide context-aware services through coordinated interactions.

Enhanced User Experience with Robotic Products:
- Proposed methods to improve usability by aligning user needs with multi-robot interaction designs.

R.3 Korea Institute of Science and Technology
Living Intelligence Space Platform for Human-Robot Interaction
Role: UX Researcher
Period: 2021.01.01 – 2022.12.31

Designed Interaction Strategies for Robotized Objects:
- Explored methods to enhance the social attributes of robotized objects based on human relationship dynamics.
- Developed multi-robot service designs to support seamless interactions within integrated environments

Proposed Unified Service Experiences:
- Conceptualized mediator robots and robotized objects for delivering cohesive and user-friendly services.

R.4 Korea Institute of Science and Technology
Development of helper robot for digital home care
Role: Researcher
Period: 2019.10.01 – 2020.12.31

Identified Core Roles for Assistive Robots:
- Analyzed commercialized assistive robots and user needs to define their roles as home companions.
- Investigated user perceptions and acceptance of assistive robots to inform design strategies.

Developed Service Scenarios:
- Created scenarios for cleaning, laundry, and cooking services, optimizing robot capabilities for daily use.

R.5 Ministry of Trade, Industry and Energy
Development of Social Robot Intelligence for Social Human-Robot Interaction of Service Robots
Role: Project Manager, Planner (Service Robot's Interaction Design Part), Researcher & Designer
Period: 2017. 4. 1 – 2020. 12. 31

Developed Guidelines for Human-Robot Interaction:
- Conducted qualitative surveys with elderly users and welfare workers to address the digital divide.
- Identified effective communication cues through sociology and psychology research.
- Designed and executed experiments to compare strategies for delivering information to elderly users.

Proposed Interaction Design Models:
- Developed interaction design guidelines to facilitate meaningful and accessible human-robot interactions for elderly users.

R.6 Ministry of Trade, Industry and Energy
Development of Emotionally Interactive Home Robot Design for Single Household
Role: Project Manager, Researcher and Designer
Period: 2014. 11. 1 – 2017. 10. 31

Investigated User Needs:
- Conducted research on socio-economic and psychological characteristics of single-person households.
- Identified design elements for social robots, including appearance, sound, and movement.

Designed Socially Effective HRI Models:
- Applied social cues from sociology and psychology to develop natural, intuitive robot interactions.

R.7 National Research Foundation of Korea
Development of Home Social Robot's Appearance and Interaction Design for Single Household
Role: Project Manager, Researcher & Designer
Period: 2016. 10. 24 – 2017. 7. 31

R.8 Naver Corporation
A Study on User-centered Robotic Product Design
Role: Researcher & Designer
Period: 2016. 5. 1 – 2016. 8. 31

R.9 Korea Foundation for the Advancement of Science and Creativity
Origami Bot
Role: Researcher & Designer
Period: 2015. 6. 29 – 2015. 12. 31

Designed and Prototyped Educational Robots:
- Developed three types of PaperBots and assembly kits (Bear, Crocodile, Parrot).
- Created scale mock-ups and interactive prototypes for hands-on learning experiences.

Collaborated Across Disciplines:

- Collaborated with cross-functional teams in design, engineering, and project management to execute the project effectively.

BOOK

B.1 **Ch1. The Robotization Design of Everyday Things**, Designing Interactions with Robots: Methods and Perspectives, CRC Press, 2024.

MEDIA

B_R. BROADCASTING

B_R.1 **MBC News** (2023)
https://imnews.imbc.com/replay/2023/nwdesk/article/6447885_36199.html

B_R.2 **YTN News** (2023)
https://www.ytn.co.kr/_ln/0105_202301220543400486

B_R.3 **YTN Science Let's Make** (2015)
https://dmb.ytn.co.kr/mytn/program_intro.php?f=2&key=201507201126206386&s_mcd=0112&s_hcd=01&page=3

A. ARTICLE

A.1 **Chosun Biz** (2023)
https://biz.chosun.com/science-chosun/science/2023/01/19/KWJBR42ZXNB4FDYKFSTPBILXZM/?utm_source=naver&utm_medium=original&utm_campaign=biz

A.2 **YTN Science Today** (2023)
https://science.ytn.co.kr/program/view.php?mcd=0082&hcd=&key=202301191652323862

A.3 **Yonhap News** (2023)
https://www.yna.co.kr/view/AKR20230119080100017?input=1195m

A.4 **Digital Chosun** (2023)
https://digitalchosun.dizzo.com/site/data/html_dir/2023/01/19/2023011980233.html

A.5 **YTN24** (2023)
https://www.ytn.co.kr/_ln/0105_202301191522174018

A.6 **Donga Science** (2023)
https://www.dongascience.com/news.php?idx=58108

A.7 **Herald Business** (2023)
http://news.heraldcorp.com/view.php?ud=20230120000341

A.8 **The Financial News** (2023)
https://www.fnnews.com/news/202301191437173711

A.9 **Robot News** (2023)
http://www.irobotnews.com/news/articleView.html?idxno=30596

A.10 **CCN News** (2023)
http://www.ccnnews.co.kr/news/articleView.html?idxno=282845

PROFESSIONAL SERVICE

ACADEMIC ORGANIZATION

Program Committee

ACM/IEEE International Conference on Human-Robot Interaction (HRI2024), Boulder, CO, USA.

Robot Design Competition Judge

IEEE International Conference on Robot and Human Interactive Communication (RO-MAN2023), Busan, Korea.

Web Chair

IEEE International Conference on Robot and Human Interactive Communication (RO-MAN2023), Busan, Korea.

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), 2023, 2022, 2021, 2018, 2016

IEEE International Conference on Robot and Human Interactive Communication (RO-MAN), 2023, 2020, 2019, 2018, 2017, 2016

ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2024, 2023, 2022