

# Sinhwa Kang, PhD

([www.sinhwakang.net](http://www.sinhwakang.net))

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## RESEARCH INTERESTS

Affective Human-Agent Interaction, Mobilephone-Mediated Communication, Mixed Reality Interaction, Computer-Mediated Communication, Social/Cognitive Psychology, Nonverbal Behavior Modeling for Virtual Humans, Research Methodology, Data Science

## EDUCATION AND TRAINING

**UCLA Extension Certificate in Data Science (INTENSIVE),  
2020 (January 2020 – March 2020)**  
University of California, Los Angeles, CA

**Ph.D. in Communication with concentration in Human-Computer Interaction,  
2008 (August 2003 – August 2008)**  
Rensselaer Polytechnic Institute, Troy, NY

*Dissertation:* The impact of affective iconic realism on anonymous interactants' social copresence in mobile video telephone communication

**M.S. in Information Design & Technology, 2002 (August 2000 – August 2002)**  
Georgia Institute of Technology, Atlanta, GA

## RESEARCH WORK EXPERIENCE

**Mixed Reality Group, USC Institute for Creative Technologies,  
Playa Vista, CA (May 2018 – December 2019)**

**: Senior Communication Scientist**

- Did research on “Human-computer interaction in mixed reality”:  
Designing and evaluating human agent interactions in VR/AR, Constructing measurements, Designing and conducting user studies, Performing data analysis
- Wrote and submitted grant proposals
- Participated in US Army funded projects

**Mixed Reality Group, USC Institute for Creative Technologies,  
Playa Vista, CA (May 2013 – April 2018)**

**: Research Associate / Communication Scientist**

- Did research on “Virtual human interviewers in immersive settings”:  
Designing and evaluating virtual human interviewers, Constructing measurements, Designing and conducting user studies, Performing data analysis
- Wrote and submitted grant proposals
- Participated in US Army funded projects

**Medical Virtual Reality Group, USC Institute for Creative Technologies,  
Playa Vista, CA (November 2011 – April 2013)**

**: Post-doctoral Researcher**

- Did research on “Virtual human counselors”: Designing and evaluating virtual human counselors, Constructing measurements, Designing and conducting user studies, Performing data analysis
- Wrote and submitted grant proposals
- Participated in US Army funded projects

**Computational Emotion Group, USC Institute for Creative Technologies,  
Playa Vista, CA (June 2007 – October 2011)**

**: Intern / Visiting Researcher / Post-doctoral Researcher**

- Did research on “Emotion and Virtual Humans”: Constructing measurements, Designing and conducting user studies, Performing data analysis
- Participated in NSF and US Army funded projects

**Social and Behavioral Research Laboratory, Rensselaer Polytechnic Institute,  
Troy, NY (August 2003 – August 2008)**

**: Graduate Research / Teaching Assistant**

- Designed and conducted the experiments for users’ perception of anonymity, social presence, and self-disclosure in computer mediated communication (Spring 2006 – Spring 2007)
- Designed and evaluated the interfaces of NSF funded projects: Information systems for kids and the blind (Spring 2005 – Fall 2005)
- Taught the class “Introduction to Hypermedia Computing (Spring 2004)”
- Assisted the class “Communication and Information Technology (Fall 2003)”

**Laboratory for Advanced Computing Initiatives, Georgia Institute of  
Technology, Atlanta, GA (January 2001 – August 2002)**

**: Graduate Research Assistant**

- Planned and designed interactive TV / games and educational websites
- Created prototypes of interfaces for interactive fictions, which were part of AFI (American Film Institute) Enhanced TV Workshop

**AWARDS AND GRANTS**

- ICMI 2019 *Best Paper Award* (2019).
- IEEE VR 2019 *Best Poster Honorable Mention Award* (2019).
- US Air Force Academy Grant \$500K for a 2-year period (2019-2021): *Distributed Collaboration in Virtual Reality* Project (Co-PI).
- US Army Research Lab Grant \$1.1MM for a 1-year period (2017-2018): *Cortically Coupled Computing for Augmented Reality* Project (Co-PI).
- Korean Ministry of Science, ICT and Future Planning Grant \$500K (Total \$2.5MM w/ 6 Korean institutes) for a 2-year period (2017-2019): *AR Based Equipment Maintenance and Training* Project (PI). [Awarded, but USC withdrew due to the lack of time to meet an export control deadline for foreign military applications]
- IEEE VR 2017 *Best Poster Award* (2017)
- Korean Ministry of Science, ICT and Future Planning Grant \$456K (Total \$1.5MM w/ 3 Korean companies) for a 2-year period (2015-2017): *Avatars in Mobile Augmented Reality* Project (PI).

- USC ICT Seedling Grant \$100K for a 1-year period (2016): *Proxemics in Virtual Reality* Project (PI).
- US Army Research Lab Grant \$600K for a 1-year period (2015-2016): *Cybernetics* Projects (Co-PI).
- Sogang University Grant \$3,534 for a 2-week period (2015): *Immersive Art & Technology Workshop* Project (Co-PI).
- Seoul Institute of the Arts Grant \$30K for a 3-month period (2014): *Virtual Reality Games* Project using mobile devices, such as tablets, smartphones, etc. (Co-PI).
- USC ICT Seedling Grant \$100K for a 1-year period (2013): *Virtual Humans over Mobile Video* Project using smartphones (Co-PI).
- CyberTherapy & CyberPsychology 2011 *New Investigator Award* for a presentation of outstanding research quality (2011)
- HICSS-41 *Best Paper Nominee* (2008)
- AAMAS'08 Scholarship (2008)
- Recognition for Microsoft / ACM Student Research Competition (2007)
- CHI 2007 Student Research Competition Grant (2007)
- IEEE WMCSA Doctoral Consortium Grant (2006)
- Rensselaer H&SS Fellowship (2005-2007)
- Rensselaer Graduate Teaching / Research Assistantship (2003-2004, 2008)
- Georgia Tech Graduate Research Assistantship (2001-2002)

## INVITED TALKS

- The Aslla Symposium: Keynote Talk (sponsored by KIST, in Gangneung, Korea)
- The US-KOREA Conference on Science, Technology and Entrepreneurship (UKC 2017 in Washington, D.C., USA)
- Center for Military Planning, KIDA (Korea Institute for Defense Analyses in Seoul, Korea)
- Office of International Affairs, Korea Polytechnic University (in Siheung, Korea)
- Convergent Content Department, ETRI (Electronics and Telecommunications Research Institute in Daejeon, Korea)
- Imaging Media Research Center, KIST (Korea Institute of Science and Technology in Seoul, Korea)
- Digital Media City R&D Center, Samsung Electronics Co. (in Suwon, Korea)
- Naver Corp. (in Sungnam, Korea)
- Graduate School of Culture Technology, KAIST (Korea Advanced Institute of Science and Technology in Daejeon, Korea)
- Department of Art & Technology, Sogang University (in Seoul, Korea)
- Graduate School of Techno Design, Kookmin University (in Seoul, Korea)
- Department of Computer Science, Gachon University (in Seongnam, Korea)
- Department of Psychology, Chung-Ang University (in Seoul, Korea)

## PROFESSIONAL AFFILIATIONS

- Member of the ACM (Association for Computing Machinery) with SIGCHI
- Member of the SPSP (Society for Personality and Social Psychology)
- Member of the ICA (International Communication Association)
- Member of the iACToR (International Association of CyberPsychology, Training, and Rehabilitation)

## SERVICES

- **Journal Reviewer:** IJHCI (International Journal of Human-Computer Interaction), JCMC (Journal of Computer-Mediated Communication), IJHCS (International Journal of Human-

- Computer Studies), IEEE Transactions on Affective Computing, PRESENCE, CAVW (Computer Animation & Virtual Worlds)
- **Conference Reviewer:** ACM (Association for Computing Machinery) CHI (Computer Human Interaction), IVA (Intelligent Virtual Agents), ICA (International Communication Association), CASA (Computer Animation and Social Agents), HICSS (Hawaii International Conference on System Sciences), ACM Ubicomp (International Joint Conference on Pervasive and Ubiquitous Computing), ACII (Affective Computing & Intelligent Interaction), IEEE VR (Virtual Reality)
  - **Conference Committee:** IEEE Virtual Reality, Virtual Worlds and Games for Serious Applications

## **PUBLICATIONS AND PRESENTATIONS**

### **BOOK CHAPTER**

Gratch, J., **Kang, S.** & Wang, N. "Using Social Agents to Explore Theories of Rapport and Emotional Resonance," In J. Gratch & S. Marsella (Eds.), *Social Emotions in Nature and Artifact*. Oxford, New York: Oxford University Press (2014)

### **JOURNAL PUBLICATIONS**

Yeom, D., Choi, J., & **Kang, S.** "Investigation of the physiological differences in the immersive virtual reality environment and real indoor environment: Focused on skin temperature and thermal sensation," *Building and Environment*, vol. 154, May 2019, p 44-54 (2019)

**Kang, S.**, Krum, D., Khooshabeh, P., Phan, T., Kevin Chang, C., Amir, O., & Lin, R. "Social Influence of Humor in Virtual Human Counselor's Self-Disclosure," *Journal of Computer Animation and Virtual Worlds* 28(3-4):e1763 (2017)

Narang, S., Best, A., Feng, A., **Kang, S.**, Manocha, D., & Shapiro, A. "Motion Recognition of Self & Others on Realistic 3D Avatars," *Journal of Computer Animation and Virtual Worlds* 28(3-4):e1763 (2017)

**Kang, S.** & Gratch, J. "Exploring Users' Social Responses to Computer Counseling Interviewers' Behavior," *Journal of Computers in Human Behavior* 34C, 120-130 (2014)

**Kang, S.** & Watt, J. "The Impact of Avatar Realism and Anonymity on Effective Communication via Mobile Devices," *Journal of Computers in Human Behavior* 29 (3), 1169-1181 (2013)

**Kang, S.** & Gratch, J. "Socially Anxious People Reveal More Personal Information with Virtual Counselors That Talk about Themselves Using Intimate Human Back Stories," *The Annual Review of CyberTherapy and Telemedicine*, Vol. 181: 202-207 (2012)

**Kang, S.** & Gratch, J. "People Like Virtual Counselors That Highly-Disclose About Themselves," *The Annual Review of CyberTherapy and Telemedicine*, Vol. 167: 143-148 (2011)

**Kang, S.** & Gratch, J. "Virtual humans elicit socially anxious interactants' verbal self-disclosure," *Journal of Computer Animation and Virtual Worlds* 21(3-4): 473-482 (2010)

Von der Putten, A., Kraemer, N., Gratch, J. & **Kang, S.** "It doesn't matter what you are!" Explaining social effects of agents and avatars," *Journal of Computers in Human Behavior* 26 (6), 1641-1650 (2010)

Choi, J. & **Kang, S.** "Generational Use of the Internet in S. Korea: The N, X, and 386 generations," *Asian Communication Journal* (April 2006)

## CONFERENCE PUBLICATIONS AND PRESENTATIONS

Mohammad, S., Stefanov, K., **Kang, S.**, Ondras, J., & Gratch, J. “Multimodal Analysis and Estimation of Intimate Self-Disclosure,” International Conference on Multimodal Interaction (Suzhou, China, Oct 2019). *\*Best Paper Award\**

**Kang, S.**, Chanenson, J., Cowal, P., Weaver, M., Ghate, P., & Krum, D.M. “Advancing Ethical Decision Making in Virtual Reality,” Extended Abstract, IEEE Virtual Reality (Osaka, Japan, March 2019). *\*Best Poster Honorable Mention Award\**

Bernardet, U., **Kang, S.**, Feng, A., DiPaola, S., & Shapiro, A. “Speech Breathing in Virtual Humans: An Interactive Model and Empirical Study,” IEEE Virtual Reality 2019 Workshop on Virtual Humans and Crowds in Immersive Environments (VHCIE), (Osaka, Japan, March 2019).

**Kang, S.**, Krum, D., Khooshabeh, P., Phan, T., & Kevin Chang. “Socio-Cultural Effects of Virtual Counseling Interviewers as Mediated by Smartphone Video Conferencing,” International Conference on Computer Animation and Social Agents (Beijing, China, May 2018)

Krum, D., **Kang, S.**, & Phan, T. “Influences on the Elicitation of Interpersonal Space with Virtual Humans,” IEEE Virtual Reality, (Reutlingen, Germany, March 2018)

Bernardet, U., **Kang, S.**, Feng, A., DiPaola, S., & Shapiro, A. “A Dynamic Speech Breathing System for Virtual Characters,” International Conference on Intelligent Virtual Agents (Stockholm, Sweden, August 2017)

Krum, D., **Kang, S.**, Phan, T., Dukes, L., & Bolas, M. “Social Impact of Enhanced Gaze Presentation Using Head Mounted Projection,” Human-Computer Interaction International Conference (Vancouver, Canada, July 2017)

**Kang, S.**, Krum, D., Khooshabeh, P., Phan, T., Kevin Chang, C., Amir, O., & Lin, R. “Social Influence of Humor in Virtual Human Counselor’s Self-Disclosure,” International Conference on Computer Animation and Social Agents (Seoul, Korea, May 2017)

Narang, S., Best, A., Feng, A., **Kang, S.**, Manocha, D., & Shapiro, A. “Motion Recognition of Self & Others on Realistic 3D Avatars,” International Conference on Computer Animation and Social Agents (Seoul, Korea, May 2017)

Krum, D., Phan, T., & **Kang, S.** “Motor Adaptation in Response to Scaling and Diminished Feedback in Virtual Reality,” Extended Abstract, IEEE Virtual Reality, (Los Angeles, USA, March 2017) *\*Best Poster Award\**

McAlinden, R., **Kang, S.**, Nye, B., Phillips, A., Campbell, J., & Goldberg, S. “Cost-Effective Strategies for Producing Engaging Online Courseware,” Interservice/Industry Training, Simulation and Education Conference (Orlando, USA, November 2016)

**Kang, S.**, Feng, A., Mike Seymour, & Shapiro, A. “Study comparing video-based characters and 3D-based characters on mobile devices for chat,” Motion in Games (San Francisco, USA, October 2016)

**Kang, S.**, Feng, A., Mike Seymour, & Shapiro, A. “Smart Mobile Virtual Character: Video Characters vs. Animated Characters,” Extended Abstract, International Conference on Human-Agent Interaction (Singapore, October 2016)

**Kang, S.**, Phan, T., Bolas, M., & Krum, D. M. “Users’ Perception of a Virtual Coach over Mobile Video Chat Interactions,” Human-Computer Interaction International Conference (Toronto, Canada, July 2016)

Krum, D. M., **Kang, S.**, Phan, T., Dukes, L. C., & Bolas, M. “Head Mounted Projection for Enhanced Gaze in Social Interactions,” Extended Abstract, IEEE Virtual Reality (South Carolina, USA, March 2016)

**Kang, S.,** Feng, A., Leuski, A., Casas, D., & Shapiro, A. "The Effect of an Animated Virtual Character on Mobile Chat Interactions," International Conference on Human-Agent Interaction (Daegu, Korea, October 2015)

**Kang, S.,** Krum, D. M., Phan, T., & Bolas, M. "'Hi, It's Me Again!' Virtual Coaches over Mobile Video," Extended Abstract, International Conference on Human-Agent Interaction (Daegu, Korea, October 2015)

**Kang, S.,** Feng, A., Leuski, A., Casas, D., & Shapiro, A. "Smart Mobile Virtual Humans: 'Chat with Me!'," Extended Abstract, International Conference on Intelligent Virtual Agents (Delft, Netherland, August 2015)

Feng, A., Leuski, A., Marsella, S., Casas, D., **Kang, S.,** & Shapiro, A. "A Platform for Building Mobile Virtual Humans," International Conference on Intelligent Virtual Agents (Delft, Netherland, August 2015)

Gordon, A., Core, M., **Kang, S.,** Wang, C., and Wienberg, C. "Civilian Analogs of Army Tasks: Supporting Pedagogical Storytelling Across Domains," In proceedings of the 11th International Conference of the Learning Sciences (Boulder, USA, June 2014)

Krum, D. M., **Kang, S.,** and Bolas, M. "Virtual Coaches over Mobile Video," In proceedings of the 27th International Conference on Computer Animation and Social Agents (Houston, USA, May 2014)

Morie, J., **Kang, S.,** & Chance, E. "The Association of In-world Avatar Investment with Expectations of Behavioral Change," Human-Computer Interaction International Conference (Nevada, USA, July 2013)

**Kang, S.** & Gratch, J. "Exploring Users' Social Responses to Computer Counseling Interviewers' Behavior," International Communication Association Conference (London, UK, June 2013)

Morie, J. & **Kang, S.** "What can your avatar tell the doctor?" The CyberPsychology & CyberTherapy 2013 Conference (Brussels, Belgium, June 2013)

**Kang, S.** & Morie, J. "Users' Socially Desirable Responding with Computer Interviewers," CHI Extended Abstracts, Computer-Human Interaction Conference (Paris, France, April 2013)

**Kang, S.** & Gratch, J. "Socially Anxious People Reveal More Personal Information with Virtual Counselors That Talk about Themselves Using Intimate Human Back Stories," The CyberPsychology & CyberTherapy 2012 Conference (Brussels, Belgium, September 2012)

**Kang, S.,** Rizzo, A. S., & Gratch, J. "Understanding the Nonverbal Behavior of Socially Anxious People during Intimate Self-disclosure," International Conference on Intelligent Virtual Agents (Santa Cruz, USA, September 2012)

**Kang, S.,** Sidner, C., Gratch, J., Artstein, R., Hwang, L. & Morency, L.-P. "Towards Building a Virtual Counselor: Modeling Nonverbal Behavior during Intimate Self-disclosure," International Conference on Autonomous Agents and Multiagent Systems (Valencia, Spain, June 2012)

Tomai, E., Thapa, L., Gordon, A., & **Kang, S.** "Causality in Hundreds of Narratives of the Same Events," The 4th Workshop on Intelligent Narrative Technologies, AI and Interactive Digital Entertainment Conference (Stanford, California, USA, October 2011)

**Kang, S.,** Sidner, C., Gratch, J., Artstein, R., Hwang, L. & Morency, L.-P. "Modeling Nonverbal Behavior of a Virtual Counselor during Intimate Self-disclosure," International Conference on Intelligent Virtual Agents (Reykjavik, Iceland, September 2011)

Kulms, P., Krämer, N., Gratch, J. & **Kang, S.** "It's in Their Eyes: A Study on Female and Male Virtual Humans' Gaze," International Conference on Intelligent Virtual Agents (Reykjavik, Iceland, September 2011)

**Kang, S. & Gratch, J.** “People Like Virtual Counselors That Highly-Disclose About Themselves,” The CyberTherapy & CyberPsychology 2011 Conference (Gatineau, Canada, June 2011) \**New Investigator Award*\*

**Kang, S., Sidner, C., Morency, L.-P. & Gratch, J.** “Turn-taking Patterns in Self-disclosure Interactions with Virtual Agents,” International Conference on Intelligent Virtual Agents (Philadelphia, USA, September 2010)

**Kang, S. & Gratch, J.** “Virtual Humans Elicit Socially Anxious Interactants' Verbal Self-disclosure,” The 23<sup>rd</sup> Annual Conference on Computer Animation and Social Agents (Saint-Malo, France, May 2010)

**Kang, S. & Gratch, J.** “The Effect of Avatar realism of Virtual Humans on Self-disclosure in Anonymous social Interactions,” CHI Extended Abstracts, Computer-Human Interaction Conference (Atlanta, USA, April 2010)

**Kang, S. & Gratch, J.** “Interactants' Most Intimate Self-disclosure in Interactions with Virtual Humans,” International Conference on Intelligent Virtual Agents (Amsterdam, Netherland, September 2009)

**Kang, S., Gratch, J. & Watt, J.** “The Effect of Affective Iconic Realism on Anonymous Interactants' Self-disclosure,” CHI Extended Abstracts, Computer-Human Interaction Conference (Boston, USA, April 2009)

**Kang, S., Watt, J. & Gratch, J.** “Associations between Interactants' Personality Traits and Their Feelings of Rapport in Interactions with Virtual Humans,” International Communication Association Conference (Chicago, USA, May 2009)

**Kang, S., Gratch, J., Wang, N., & Watt, J.** “Agreeable People Like Agreeable Virtual Humans,” International Conference on Intelligent Virtual Agents (Tokyo, Japan, September 2008)

**Kang, S., Gratch, J., Wang, N., & Watt, J.** “Does the Contingency of Agents' Nonverbal Feedback Affect Users' Social Anxiety?” International Conference on Autonomous Agents and Multiagents Systems (Estoril, Portugal, May 2008)

**Kang, S., Watt, J. & Ala, S.** “Social Copresence in Anonymous Social Interactions Using a Mobile Video Telephone,” Computer-Human Interaction Conference (Florence, Italy, April 2008)

**Kang, S., Watt, J. & Ala, S.** “Communicators' Perceptions of Social Presence as a Function of Avatar Realism in Small Display Mobile Communication Devices,” Hawaii International Conference on System Sciences (Big Island, USA, January 2008) \**Best Paper Nominee*\*

**Kang, S.** “The Impact of Digital Iconic Realism on Anonymous Interactants' Mobile Phone Communication,” Computer-Human Interaction Conference, Microsoft / ACM Student Research Competition (San Jose, USA, April 2007)

**Kang, S., Watt, J. & Isbister, K.** “The Effect of Static Anthropomorphic Images on Emotion Perceptions in Mobile Phone Communication,” International Workshop on Presence 2006 (Cleveland, USA, August 2006)

**Kang, S.** “The Ethnographic Study of Female Teen's Mobile Phone-Mediated Activity in the US,” Hawaii International Conference on Social Science (Honolulu, USA, May 2006)

**Kang, S.** “The Effect of Avatar Realism on Users' Sense of Social Presence in Emotionally Engaged Mobile Phone Communication,” IEEE Workshop on Mobile Computing Systems and Applications, Doctoral Consortium (Blaine, USA, April 2006)

**Kang, S.** & Choi, J. "Internet Use and Age: A Cross-Cultural Approach - the U.S. and South Korea," Presented at the International Communication Association Conference (New York, USA, May 2005)

MacIntyre, B., Bolter, J.D., Vaughn, J., Hannigan, B., Gandy, M., Moreno, E., Haas, M., **Kang, S.**, Krum, D., Volda, S. "Three Angry Men: An Augmented-Reality Experiment in Point-of-View Drama. First International Conference on Technologies for Interactive Digital Storytelling and Entertainment (Darmstadt, Germany, March 2003)