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Yonsei University
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CAREER

Researcher, Yonsei University, Seoul, Korea 2015.03 - Present

- Integrate cognitive user experience on intelligent systems
- Developed multiple agent system for task scheduling

Student Researcher, KIST, Seoul, Korea 2005.03 - 2015.02

- Researched mainly computational intelligence related to human-computer interaction, computer vision, and robotics
- Especially focused on human-like memory model to be computationally implemented
- Developed various intelligent systems based on pattern recognition algorithms
- Managed several research projects and supervised Master's degree students

Developer, EstSoft Inc., Seoul, Korea 2004.06 - 2005.02

- Developed a Digital Rights Management platform that wraps multimedia contents with a corresponding software: the product name was 'ALX'
- Role: Developed encoding and decoding processes using encryption algorithms

Researcher, FIST Inc., Seoul, Korea 2002.03 - 2004.05

- Investigated fingerprint images acquired from optical and capacitive sensors
- Developed a fingerprint identification system after image preprocessing
- Participated an international Fingerprint Verification Contest (FVC 2004)
- Role: Developed and implemented the overall algorithm for the fingerprint identification

EDUCATION

University of Science & Technology (UST), Seoul, Korea 2005.03 - 2015.02

- Ph.D. via Integrated Program,
- Major of Human-Computer Interaction & Robotics
- Thesis title: Incremental Associative Memory Modeling by Extended Hypernetworks for Non-stationary Data

Seoul National University, Seoul, Korea 1998.03 - 2002.02

- B.S,
- Department of Nuclear Engineering

RESEARCH INTEREST

Computational Intelligence & Machine Learning

- Neural associative memory, Context-awareness, Cognitive emergent architecture, Large-scale data mining, On-line Incremental learning,

Human-Computer Interaction

- Human-robot interaction, Robotic Autonomy in Tele-operation, Imitation learning, Multi-modal sensor network, Natural user interface, 3D Interaction

Computer Vision

- Content-based image retrieval, Object recognition, Augmented reality

PUBLICATION

Journal

- [j.9] Park, S. Y. Park, J. M. Kim, J. I. **H. Kim**, I. H. Kim and S. J. Ye, *Textural feature calculated from segmental fluences as a modulation index for VMAT*, Physica Medica, 2015. (**SCI, IF 2.403**)
- [j.8] J. M. Park, S. Y. Park, and **H. Kim**, *Modulation index for VMAT considering both mechanical and dose calculation uncertainties*, Physics in Medicine and Biology, Vol. 60, No. 18, pp. 7101-7125, 2015. (**SCI, IF 2.92**)
- [j.7] S. Im, **H. Kim**, and J. H. Park, *Tabletop Collaborative Game Design based on Inclusive Education Methodology*, Journal of the HCI Society of Korea, Vol. 9, No. 2, pp. 61-68, 2014.
- [j.6] J. M. Park, S. Y. Park, **H. Kim**, J. H. Kim, J. Carlson, and S. J. Ye, *Modulation Indices for Volumetric Modulated Arc Therapy*, Physics in Medicine and Biology, Vol. 59, No. 23, pp. 7315-7340, 2014 (**SCI, IF 2.761**)
- [j.5] **H. Kim** and J. H. Park, *Hypergraph-based Recognition Memory Model for Lifelong Experience*, Computational Intelligence and Neuroscience, vol.2014, 2014. (**SCIE, IF 0.596**)
- [j.4] L. Sadita, **H. Kim**, and J. H. Park, *Temporal Clustering for Generating Activity-based Diary in PC Environment*, Journal of KIISE: Computing Practices and Letters, 2012
- [j.3] **H. Kim** and J. H. Park, *Evaluating the regularity of human behavior form mobile phone usage logs*, Lecture Note in Artificial Intelligence, Vol. 7104, pp. 3-14, 2012
- [j.2] **H. Kim**, I. Han, B. J. You, and J. H. Park, *Towards cognitive grasping: modeling of unknown objects and its corresponding grasp types*, Journal of Intelligent Service Robotics, Vol. 4, No. 3, pp. 159-166, 2011 (**SCIE, IF 0.658**)
- [j.1] I. Han, **H. Kim**, K. Kim, and J. H. Park, *Foreground-layer segmentation and tracking from sequential stereo images for 3D object modeling*, Journal of the HCI Society of Korea, Vol. 6, No. 1, pp. 9-16, 2011

Conference

- [c.23] B. Koo, S. Baek, **H. Kim**, and K. Cho, *Personalization of Conversational Agent Influences Users Intimacy and Information Reliability*, In Proc. of the HCI Korea (HCIKorea), Extended Abstract, 2015.
- [c.22] Y. Park, S. Kwon, B. Koo, **H. Kim**, J. Jang, and K. Cho, *Evaluation of a New Egocentric Smartwatch Interface*, In Proc. of the HCI Korea (HCIKorea), Extended Abstract, 2015.
- [c.21] **H. Kim**, S. Kwon, J. Kim, J. Jeon, L. Jack, and K. Cho, *Fragment-based Image Reconstruction via Associative Memory Model*, Conf. on Korea CogSci, Abstract, 2015.
- [c.20] S. Kwon, B. Koo, J. Kim, **H. Kim**, and K. Cho, *Wristband healthcare device controllable multimodal feedback for elderly patient*, Conf. on Korea CogSci, Abstract, 2015.
- [c.19] **H. Kim**, J. S. Kim, K. Ryu, S. Cheon, Y. Oh, and J. H. Park, *Task-oriented Teleoperation through Natural 3D User Interaction*, In Proc. of the Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI), 2014.
- [c.18] **H. Kim** and J. H. Park, *DuplicateSpace: Enhancing Operability of Virtual 3D Objects by Asymmetric Bimanual Interaction*, In Proc. of the Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI), 2014.
- [c.17] **H. Kim**, J. S. Kim, K. Ryu, S. Cheon, Y. Oh, and J. H. Park, *Mixed Reality-based 3D Interaction for Robotic Teleoperation*, In Proc. of the Korea Robotics Society Annual Conference (KRoC), 2014.

- [c.16] L. Sadita, **H. Kim**, and J. H. Park, *Generating activity-based diary from PC usage logs*, Korea Computer Congress (KCC), 2012, *Best Paper Award*.
- [c.15] **H. Kim**, D. Yoon, and J. H. Park, *User-centered space registration for 3D remote interaction*, Asia-Pacific Computer Human Interaction (APCHI), 2012.
- [c.14] **H. Kim**, I. Han, S. J. Kim, B. J. You, and J. H. Park, *Human-demonstration based approach for grasping unknown objects*, In Proc. of the Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI), 2011, *Best Video Award*.
- [c.13] I. Han, **H. Kim**, and J. H. Park, *Graph-cut-based 3D model segmentation for articulated object reconstruction*, In Proc. of the Intl. Symposium on Mixed and Augmented Reality (ISMAR), 2011.
- [c.12] **H. Kim** and J. H. Park, *Evaluating the regularity of human behavior from mobile phone usage logs*, In Proc. of Behavior Informatics held in conjunction with Pacific-Asia Conf. on Knowledge Discovery and Data Mining (PAKDD), 2011.
- [c.11] K. Kim, **H. Kim**, I. Han, S. J. Kim, and J. H. Park, *Cooperative grasp system for network-based humanoids*, In Proc. of the Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI), 2010.
- [c.10] **H. Kim** and J. H. Park, *Multimodal user guide for experience sharing based on activity modeling*, The Intl. Conf. on Advances in Multimedia (MMEDIA), 2010.
- [c.9] I. Han, **H. Kim**, K. Kim, and J. H. Park, *Object segmentation and tracking from sequential stereo images for 3D object modeling*, In Proc. of the HCI Korea (HCIKorea), 2010, *Best Paper Award*.
- [c.8] **H. Kim**, K. Park, K. Kim, and J. H. Park, *Segmentation of continuous human gestures for imitative learning*, In Proc. of the Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI), 2009.
- [c.7] **H. Kim**, I. J. Kim, H. G. Kim, and J. H. Park, *Adaptive modeling of a users daily life with a wearable sensor network*, In Proc. of the Intl. Symp. on Multimedia (ISM), 2008.
- [c.6] K. Park, **H. Kim**, H. Lee, and J. H. Park, *Gesture spotting based on dynamic time warping for imitative learning*, In Proc. of the Korea Robotics Society Annual Conference (KRoC), 2008.
- [c.5] H. Lee, **H. Kim**, K. Park, and J. H. Park, *Robot learning by observation based on Bayesian networks and game pattern graphs for human-robot game interactions*, In Proc. of the Intl. Conf. on Intelligent Robots and Systems (IROS), 2008.
- [c.4] K. Park, **H. Kim**, H. Lee, and J. H. Park, *Adaptive communication selection for multiple-robot interaction*, In Proc. of the Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI), 2007.
- [c.3] **H. Kim**, I. J. Kim, and H. G. Kim, *Video surveillance using dynamic configuration of multiple active cameras*, In Proc. of the Intl. Conf. on Image Processing (ICIP), 2006.
- [c.2] **H. Kim** and J. H. Park, *A study on the intention-based context-aware model for video surveillance system*, In Proc. of the Korea Computer Congress (KCC), 2006.
- [c.1] S. Kim, **H. Kim**, and J. H. Park, *Behavior management for humanoid robot under divided attention*, In Proc. of the Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI), 2006.

PATENT

[p.3] **H. Kim**, S. J. Lee, and J. W. Song, Delivery Schedule Managing System and Method therefor, (10-2015-0099725)

[p.2] J. H. Park, **H. Kim**, I. Kim, and E. Hong, Image Restoration from Fragmented Image Patches based on Associative Memory Model, (10-2014-0098045)

[p.1] K. Kim, K. Song, S. Ha, J. H. Park, I. Han, and **H. Kim**, Tangible Science Experiment System and Providing Method, (2011-01-06393)

Software programs

[s.10] **H. Kim**, J. H. Park, and D. Yoon, Virtual Interactive Space Setting Software, (2011-01-129-007984)

[s.9] I. Han, K. Kim, **H. Kim**, J. H. Park, and B. J. You, Segmentation and Reconstruction of 3D Object Model, (2010-01-129-000480)

[s.8] I. Han, K. Kim, **H. Kim**, J. H. Park, and B. J. You, Unified Recorder of a Stereo Camera, (2010-01-129-000468)

[s.7] I. Han, K. Kim, **H. Kim**, J. H. Park, and B. J. You, 3D Image Editor for Object Modeling, (2010-01-129-000478)

[s.6] I. Han, K. Kim, **H. Kim**, J. H. Park, and B. J. You, Viewer for Multiple 3D Images, (2010-01-129-000479)

[s.5] **H. Kim**, J. H. Park, H. G. Kim, and I. J. Kim, User Modeling via High-level Meta-data Tagging, (2008-01-129-007319)

[s.4] **H. Kim**, J. H. Park, H. G. Kim, and I. J. Kim, Extracting Meta-data from Multi-modal Sensors for User modeling of Transportation routines, (2008-01-129-007318)

[s.3] **H. Kim**, J. H. Park, and B. J. You, Sequential Gesture Spotting using an Accelerometer, (2008-01-129-006607)

[s.2] **H. Kim**, J. H. Park, and B. J. You, Game Learning Algorithm using Bayesian Networks and Pattern Graphs, (2008-01-129-006619)

[s.1] **H. Kim**, H. G. Kim, S. Ahn, I. J. Kim, and S. Y. Lee, Dynamic Configuration of Active Cameras for Surveillance, (2006-01-129-005200)

RESEARCHES EXPERIENCE

Computational intelligence

Recognition Memory Model

2013.01 - 2014.03

Independent & Researcher

- Hypergraph-based memory mechanism including encoding, judgment, and retrieval.
- Designed the human-like recognition memory model, especially on the familiarity.
- Implemented a recognition memory model and applied to life-log data and word learning

Brain-like Associative Memory

2011.02 - 2013.01

Independent & Researcher

- Designed an associative memory model that supports various types of associations such as auto/hetero, multi-directional, and collaborative associations
- Implemented a multi-directional associative memory for Fragment-based image reconstruction

- Temporal Associative Memory** 2009.03 - 2011.01
Independent & Researcher
- Designed a graphical associative memory model for the precise recall and prediction of the large-scale behavioral data
 - Implemented an incrementally learnable algorithm of Dynamic Hypernetworks in order to model between temporally correlated life-log data such as reality-mining data
- Adaptive User Modeling** 2006.03 - 2008.04
Project Manager & Researcher
- As a sub-project of ‘Development of the Personal Life Log System’
 - Designed a multi-level activity architecture for the integration of multi-modal information from wearable sensor networks
 - Implemented preprocessing algorithms for various types of recognition such as faces, locations, gestures, and speeches
 - Built a probabilistic activity model that is adapted by the context of the users
- Active Video Surveillance System** 2005.05 - 2006.01
Independent & Researcher
- Detected and tracked a person in a hallway by dynamic configuration between networked Pan-Tilt-Zoom Cameras
 - Constructed an agent-based system that independently performs as an active camera and cooperates with other cameras
- Human-Robot Interaction**
- Robotic Tele-operation via Natural User Interface** 2013.04 - 2013.11
Project Manager & Researcher
- As a sub-project of ‘Development of Cooperative Network-based Humanoid Technology’
 - Developed 3D natural user interaction platform
 - Integrated interaction method into the robotic tele-operation
- Cooperative Robotic Grasping** 2009.03 - 2010.02
Project Manager & Researcher
- As a sub-project of ‘Development of Cooperative Network-based Humanoid Technology’
 - Researched cooperative grasping planning by combining two humanoid robots with different functionalities
- Robotic Grasp Learning by Human Demonstration** 2008.03 - 2009.09
Project Manager & Researcher
- As a project of ‘Development of Self-Learning Technologies of Human Task Skills using Cognitive Models’
 - Designed a robotic grasp planning for unknown object by using a data-glove
 - Integrated a grasp planning by human demonstration into a network-based humanoid robot
- Human Gesture Spotting for Imitation Learning** 2008.02 - 2008.07
Project Manager
- As a sub-project of ‘Development of Cooperative Network-based Humanoid Technology’
 - Developed an algorithm to segment continuous human motions into a combination of primitive gestures even a seamless gesture

	Social Game Learning by Imitation	2006.12 - 2008.02 <i>Project Manager & Researcher</i>
	<ul style="list-style-type: none"> • As a sub-project of 'Development of Cooperative Network-based Humanoid Technologies' • Designed a cognitive architecture for an intelligent robot • Implemented a humanoid robot which learns how to play social games such as rock-paper-scissors by observing human interaction 	
Computer Vision	Fragment-based Image Retrieval	2011.02 - 2011.05 <i>Independent & Researcher</i>
	<ul style="list-style-type: none"> • Reconstructed an entire image from a single image fragment via multi-directional associative memory • Conducted noise reduction and recognized facial images with different poses for the content-based image retrieval 	
	Articulated Object Segmentation	2011.01 - 2011.06 <i>Project Manager</i>
	<ul style="list-style-type: none"> • Proposed 3D model segmentation for articulated object reconstruction from sequential stereo images • Implemented real-time segmentation of articulated object along a joint by a graph-cut-based approach 	
	3D Hand Tracking on TableTop	2010.06 - 2010.10 <i>Project Manager</i>
	<ul style="list-style-type: none"> • As a sub-project of 'Tangible Interaction Technology' • Implemented 3D hand tracking algorithm by using stereo vision on the tabletop display 	
	Shape Classification of 3D Objects	2008.03 - 2010.02 <i>Project Manager & Researcher</i>
	<ul style="list-style-type: none"> • As a sub-project of 'Development of Cooperative Network-based Humanoid Technology' • Classified unknown objects according to the grasping types by using Eigenshape approach • Implemented 3D object reconstruction including segmentation and tracking of the target object from stereo vision 	
	Interactive Video Object	2005.10 - 2005.12 <i>Independent & Researcher</i>
	<ul style="list-style-type: none"> • As a term project in the course of 'Human-computer interaction' • Conducted synthesis of interactive animal motions by constructing a motion chain from previously recorded video images 	
Human-Computer Interaction	User-centered 3D Bimanual Interaction	2014.01 - 2014.12 <i>Project Manager & Researcher</i>
	<ul style="list-style-type: none"> • As a sub-project of 'Development of Humanoid Technology for Remote Task Execution' • Designed puppet interaction by bi-manual interaction • Developed user interface for spatial interaction by combining optical see-through HMD and Leap Motion Device 	
	DuplicateSpace: 3D Interaction Platform	2012.01 - 2012.12 <i>Project Manager & Researcher</i>

- As a sub-project of ‘Development of Intelligent Task-Execution Technology for Robots using Spatial Interaction’
- Designed an 3D interaction platform by asymmetric bi-manual interaction
- Developed the whole communicative architecture

User-centered 3D Remote Interaction

2011.01 - 2011.12

Project Manager & Researcher

- As a sub-project of ‘Development of Intelligent Task-Execution Technology for Robots using Spatial Interaction’
- Designed a user-centered 3D remote interaction method using a 6-DoF motion tracker
- Provided a personalized interacting space to manipulate virtual 3D objects without environmental and physical constraints

Multi-modal User Guide System

2008.08 - 2009.02

Project Manager & Researcher

- As a sub-project of ‘Development of the Personal Life-Log System’
- Analyzed abnormal behavior patterns based on multi-level activity modeling
- Implemented an interactive tour guide system that provides audio-visual feedback to users for the purpose of sharing experiences.

REVIEW

IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS 2014, 2012, 2010, 2009)
 IEEE Intl. Symposium on Robot and Human Interactive Communication (RO-MAN 2014)
 IEEE Intl. Conf. on Robotics and Automation (ICRA 2009)
 The Journal of Korean Institute of Next Generation Computing
 Intl. Conf. on Ubiquitous Robots and Ambient Intelligence (URAI 2014)
 Korea Computer Congress (KCC 2009)

STUDENT ADVISOR

Kyungwha Park	2006 - 2008
Master’s degree, Researched imitation learning of a humanoid robot	
Sundeuk Kim	2007 - 2007
Three months Internship, Studied card classification by multi-layer perceptron	
Soyun Won	2007 - 2007
Three months Internship, Developed quality-threshold clustering algorithm	
Kyungkoo Kim	2008 - 2010
Internship and Master’s degree, Researched cooperative robotic grasping by human demonstration	
Inkyu Han	2008 - 2011
Internship and Master’s degree, Researched 3D object reconstruction and articulated object segmentation	
Eunji Chong	2010 - 2011
Three months Internship, Developed dialog-based identification system	
Jungsik Ahn	2010 - 2011
Internship, Developed incremental identification system	
Lia Sadita	2011 - 2013
Master’s degree, Researched adaptive user modeling and activity diary generation from PC activity logs	
Chanseok Kang	2012 - 2012
Internship, Developed 3D hand gesture recognition using KINECT	

SKILL

Language: C, C++, MFC, Matlab
Library: OpenCV, OpenGL
Software: SPSS
OS: Windows

REFERENCE

Ji-Hyung Park (advisor)
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Professor, Dep. of Human Computer Interaction and Robotics, UST
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