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EDUCATION

Jan 2005 ~	Ph.D.	University of Southern California , Los Angeles, CA
Dec 2009		Doctor of Philosophy in Computer Science (GPA: 3.83 / 4.0), Dissertation: Modeling Human Reaching and Grasping: Cortex, Rehabilitation and Lateralization (Chair: Michael A. Arbib, Ph.D)
Aug 2003 ~	M.S.	University of Southern California , Los Angeles, CA
May 2005		Master of Science in Computer Science (GPA: 4.0 / 4.0),
Mar 1998 ~	B.S.	Seoul National University , Seoul, South Korea
Feb 2002		Bachelor degree in Electrical Engineering, Feb. 2002 Transferred from School of Nuclear Engineering, Feb. 2000
Mar 1995 ~		HanSung Science High School , Seoul, South Korea
Feb 1998		High school diploma, Feb 1998

CURRENT RESEARCH INTERESTS

- Motor Control Theory for arm movements, which mimics biologically natural movements
- Machine Learning for biological data, especially neuroimages of brains

RESEARCH EXPERIENCE

Mar 2015 ~	Research Professor (advisor: Joon-Kyung Seong Ph.D)
	Institute of Global Health Technology, Korea University, Seoul, Republic of Korea
Mar 2013 ~	Research Professor (advisor: Joon-Kyung Seong Ph.D)
Feb 2015	Institute of Health Science, Korea University, Seoul, Republic of Korea
Jan 2013 ~	Postdoctoral Researcher (advisor: Joon-Kyung Seong Ph.D)
	Biomedical Engineering, Korea University, Seoul, Republic of Korea Analyzing Diffusion Tensor Imaging (DTI) of Alzheimer's disease
Apr 2010 ~	Postdoctoral Researcher (WCU program, advisor: Marcus Kaiser Ph.D)
Dec 2012	Brain and Cognitive Science, Seoul National University, Seoul, Republic of Korea Analyzing Diffusion Tensor Imaging (DTI) of aging controls and patients

Jan 2005 ~ **Research Assistant** (advisor: Michael Arbib, Ph.D. & Nicolas Schweighofer, Ph.D)
Jul 2009 University of Southern California, Los Angeles, U.S.A.
Supported by NIH P20 (Jan 2005 ~ Jul 2007)
Developing a cortical model of the motor cortex
a model of stroke rehabilitation in aspect of optimal therapy
a model of variability in reach-to-grasp action
a computational model of Mental Imagery Motor Practice, and
the Bilateral Arm Reaching Task (BART) – US patent

Jan 2004 ~ **Direct Research** (advisor: Michael Arbib, Ph.D.)
Dec 2004 University of Southern California, Los Angeles, U.S.A.

Jan 2002 ~ **Internship** (advisor: Byoungtak Zhang, Ph.D.)
Jul 2002 Center for Bioluminescence Tech., Seoul National University, Seoul, South Korea

TEACHING EXPERIENCE

Sep 2015~ **Instructor:** Biomedical Imaging II (teaching in English)
Department of Biomedical Engineering, Korea University, Seoul, Republic of Korea
Instructor: Biomedical Image Processing (teaching in English)
College of Biomedical Engineering, Korea University, Seoul, Republic of Korea

Mar 2013 ~ **Instructor:** Medical Imaging systems for dentistry (Spring semesters)
Dental Laboratory Science and Engineering, Korea University, Seoul, Republic of Korea
Excellence in Teaching Award in 2014.
Students' Evaluation: 2013, 5.65/6 (University average: 4.89); 2014, 5.41/6 (4.91)

Apr 2010 ~ **Teaching Assistant:** Computational Neuroscience and Neuroinformatics (Spring semesters)
June 2012 Brain and Cognitive Science, Seoul National University, Seoul, Republic of Korea

Aug 2007 ~ **Teaching Assistant:** Machine Learning (Fall semesters) & Foundation of Artificial
May 2009 Intelligence (Spring semesters)
Computer Science, University of Southern California, Los Angeles, U.S.A

PATENT

Apr 16, 2013 **US patent #US8419661 B2:** Upper Limb Measurement and Rehabilitation Method and System, Nicolas Schweighofer, Younggeun Choi, **Cheol Han**, James Gordon, Carolee J Winstein, Reiko Osu

RESEARCH SUPPORT (as PI)

May 1, 2014 ~ Apr 30, 2017 Developing comparison methods of dementia types using network analysis techniques (**2014R1A1A1008173**, Role: Principal Investigator)
Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Korea government: the Ministry of Science, ICT & Future Planning (MSIP, 신진연구)

PEER-REVIEWED PUBLICATIONS (IF and rank based on JCR2013)

1. A geometric network model of intrinsic grey-matter connectivity of the human brain, Y-P Lo, R O'Dea, J Crofts, **CE Han**, and Marcus Kaiser, 2015, Scientific Reports (*In Press*, 5-year IF=5.078, #5/55 in Multidisciplinary sciences)
2. Structural connectivity changes in temporal lobe epilepsy: Spatial features contribute more than topological measures, P Taylor†, **CE Han†**, JC Schoene-Bake, B Weber, M Kaiser, 2015, Neuroimage: Clinical, 8: 322-328 (†: first authors, online available since Feb 20, 2015)
3. A Network Flow-based Analysis of Cognitive Reserve in Normal Ageing and Alzheimer's Disease, SW Yoo, **CE Han**, SY Shin, SW Seo, DL Na, Y Jeong, JK Seong, 2015, Scientific Reports 5, Article #10057 (5-year IF=5.078, #5/55 in Multidisciplinary sciences)
4. Predicting Age across Human Lifespan Based on Structural Connectivity from Diffusion Tensor Imaging, **CE Han**, LR Peraza, JP Taylor, M Kaiser, 2014, Proceedings of BIOCAS2014 (IEEE), 137-140
5. Adolescent Brain Maturation and Cortical Folding: Evidence for Reductions in Gyrification, D Klein, E Genc, A Rotarska-Jagiela, S Sritharan, H Mohr, F Roux, **CE Han**, M Kaiser, W Singer, PJ Uhlhaas, 2014, PLoS One 9(1): e84914 (5-year IF=4.015, #8/55 in Multidisciplinary sciences)
6. Preferential Detachment During Human Brain Development: Age- and Sex-Specific Structural Connectivity in Diffusion Tensor Imaging (DTI) Data, S Lim, **CE Han***, PJ Uhlhaas*, M Kaiser*, 2013, Cerebral Cortex, 25(6): 1477-89 (* shared senior authorship, 5-year IF=8.372, #16/252 in Neuroscience, online available since Dec.15, 2013)
7. Cluster-based statistics for brain connectivity in correlation with behavioral measures, **CE Han**, SW Yoo, SW Seo, DL Na, JK Seong, 2013, PLoS One 8(8): e72332 (5-year IF=4.015, #8/55 in Multidisciplinary sciences)
8. Quantifying Arm Non-use in Individuals Post-stroke, **CE Han†**, S Kim†, S Chen, YH Lai, JY Lee, J Lee, R Osu, CJ Winstein, N Schweighofer, 2013, Neurorehabilitation and Neural Repair, 27(5):439-47 († both are the first authors, 5-year IF=5.159, #1/62 in rehabilitation)
9. Use it and improve it or lose it: Interactions between arm function and use in human post-stroke, Y Hidaka, **CE Han**, SL Wolf, CJ Winstein, N Schweighofer, 2012, PLOS Comput Biol, 8(2): e1002343 (5-year IF=5.670, #3/52 in Mathematical & computational biology)

10. Integrating temporal and spatial scales: Human structural network motifs across age and region-of-interest size, C Echtermeyer, **CE Han**, A Rotarska-Jagiela, H Mohr, PJ Uhlhaas, M Kaiser, 2011 *Frontiers in Neuroinformatics*, 5:10
11. The role of Chaotic Resonance in Cerebellar Learning, IT Tokuda, **CE Han**, K Aihara, M Kawato, N Schweighofer, 2010 *Neural Networks*, 23(7):836-42 (5-year IF=2.516)
12. Motor Learning without Doing: trial-by-trial improvement in motor performance during mental training, R Gentili, **CE Han**, N Schweighofer, C Papaxanthis, 2010, *Journal of Neurophysiology*, 104(2):774-83 (* all authors contributed equally. 5-year IF=3.446)
13. A functional threshold for long-term use of hand and arm function can be determined: Predictions from a computational model and supporting data from the Extremity Constraint-Induced Therapy Evaluation (EXCITE) Trial, N Schweighofer, **CE Han**, S Wolf, MA. Arbib, C Winstein, 2009, *Physical Therapy*, 89(12):1327-36. (5-year IF, 3.896, #2/62 in rehabilitation, #4/67 in Orthopedics)
14. Stroke rehabilitation reaches a threshold, **CE Han**, MA Arbib, N Schweighofer, *PLoS Comput Biol.*, 2008 Aug 22; 4(8): e1000133 (selected as a featured research of the month, 5-year IF=5.670, #3/52 in Mathematical & computational biology)
15. Humans can adopt optimal discounting strategy under real-time constraints, N Schweighofer, K Shishida, **CE Han**, Y Okamoto, SC Tanaka, S Yamawaki, K Doya, *PLoS Comput Biol.* 2006 Nov 10;2(11):e152 (5-year IF=5.670, #3/52 in Mathematical & computational biology).

PUBLICATIONS (UNDER REVIEW & IN PREPARATION)

1. Progressive Pattern of White Matter Connectivity Disruption in Subcortical Vascular Cognitive Impairment, **CE. Han**†, BS Ye†, SW Yoo, HJ Kim, DL Na, SW Seo*, JK Seong*, *Neurology* (under revision, †: first authors, *: corresponding authors)
2. Connectional fingerprints in Schizophrenia: A Novel Network Analysis of Diffusion Tensor Imaging Data, S Thanarajah†, **CE Han**†, A Rotarska-Jagiela, W Singer, R Deichmann, K Maurer, M Kaiser, PJ Uhlhaas*, *PLOS One* (under revision, †: first authors)
3. Reduced fronto-subcortical connectivity in association with suicidal ideation in major depressive disorder: graph theoretical analysis of a diffusion tensor imaging , W Myung†, **CE Han**†, M Fava, D Mischoulon, GI Papakostas, JY Heo, K Kim, DK Kim, SW Seo, JK Seong*, HJ Jeon*, *Journal of Psychiatry and Neuroscience* (under revision, †: first authors, *: corresponding authors)
4. Tract-specific Correlates of Neuropsychological Deficits in Patients with Subcortical Vascular Cognitive Impairment, NY Jung†, **CE Han**†, HJ Kim, SW Yoo, HJ Kim, EJ Kim, DL Na, SN Lockhart, WJ Jagust, JK Seong*, SW Seo*, *Journal of Alzheimer's Disease* (under review, †: first authors, *: corresponding authors)

5. Predicting Surgery Targets in Temporal Lobe Epilepsy through Structural Connectome Based Simulations, F Hutchings, **CE Han**, B Weber, PN Taylor, M Kaiser, PLOS CB (*under revision*)
6. Subtyping of the early stage Alzheimer's disease, JY Park†, HK Na†, DL Na, **CE Han***, JK Seong*, SW Seo* (*in preparation*, †: first authors, *: corresponding authors)
7. Different rich club organization in Alzheimer's disease and Subcortical Vascular dementia, **CE Han**†, WJ Lee, HJ Kim, DL Na, SW Seo*, JK Seong* (*in preparation*).
8. Rehabilitation reduces the normalized Non-use: a novel method to quantify non-use, **CE Han**, S Kim, N Schweighofer, C Winstein (*in preparation*)
9. Effort and reward discounting determine arm choice in individuals with stroke, S Kim, H Park, **CE Han**, CJ Winstein, N Schweighofer (*in preparation*)
10. Epilepsy patients have disrupted connectional fingerprints, **CE Han**, JC Schoene-Bake, B Weber, M Kaiser (*in preparation*)
11. Two different pathways of cortical atrophy in normal aging and Alzheimer's diseases, **CE Han**, JH Shin, DL Na, SW Seo, JK Seong (*in preparation*).
12. Cognitive Decline in neuromyelitis optica (NMO) is associated with white matter disruption, EB Cho†, **CE Han**†, JH Min*, JK Seong* (*in preparation*, †: first authors, *: corresponding authors)
13. Internal Signal Dependent Noise Accounts for Mental Fitts' Law, **CE Han**, N Gueugneau, C Papaxanthis, N Schweighofer (corresponding author, *in preparation*)
14. Rapid update of predictive models, C Papaxanthis, N Gueugneau, **CE Han**, N Schweighofer (*in preparation*)

PRESENTATIONS

1. Disrupted rich club organization in Alzheimer's disease and subcortical vascular dementia: simulation study, **CE Han**, WJ Lee, HJ Kim, SW Seo, JK Seong, Society for Neuroscience 2015 at Chicago (US), 482.12/B81
2. Disrupted rich club organization in Alzheimer's disease and subcortical vascular dementia, **CE Han**, HJ Kim, SW Seo, JK Seong, Organization of Human Brain Mapping 2015 at Hawaii (US), Poster Number: 1759.
3. Effort and reward discounting determine arm choice in individuals with stroke, S Kim, H Park, **CE Han**, CJ Winstein, N Schweighofer, Society for the Neural Control of Movement 2015 at Charleston (US).
4. Multi-source execution noise predicts optimal movement duration in reaching movements without visual feedback, Y.Xiao, **C. Han**, J. Gordon, N. Schweighofer' Society for Neuroscience 2010 at San Diego (US), 493.12/GGG3.
5. Modulation of Fitts's law for actual and imagined arm movements during the day, C. Papaxanthis, N Gueugneau, **CE Han**, N. Schweighofer, Society for Neuroscience 2010 at San Diego (US), 493.5/FFF18

6. Effects of the intensity of Constraint Induced Therapy on long-term arm use and function in patients with stroke: Predictions from a computational model, Y Hidaka, **CE Han**, S Wolf, C Winstein, N Schweighofer, Society for Neuroscience 2009 at Chicago (US): 769.17/DD58
7. Objective quantification of paretic arm nonuse for stroke using bilateral arm reaching task, SY Chen, **CE Han**, YH Lai, Y Hidaka, J Lee, CJ Winstein, N Schweighofer, Society for Neuroscience 2009 at Chicago (US): 769.11/DD52.
8. BART: A novel laboratory-based instrument to quantify preferred limb use in patients after stroke, S Chen, **CE Han**, N Parikh, J Lee, JY Lee, E Xu, C Winstein, N Schweighofer, Society for Neuroscience 2008 at Washington DC (US): 276.14/KK248. (Won 'the most innovative runners-up award' from 2009 USC School of Dentistry Research Day on Feb 18, 2009)
9. Variability in detouring strategies in reach-to-grasp behavior: a computational model of individualized strategies with virtual target hypothesis, **CE Han**, J Tretriluxana, C Winstein, MA Arbib, Society for Neuroscience 2008 at Washington DC (US): 466.3/KK12
10. Learning without doing: experiment and computational model, N Schweighofer, R Gentili, **CE Han**, C Papaxanthis, Society for Neuroscience 2007 at San Diego (US): 281.12/GG22
11. Effects of constraint induced therapy in reaching performance and spontaneous hand use after motor cortex lesion: predictions from a computational model, **CE Han**, MA Arbib, N Schweighofer, Society for Neuroscience 2007 at San Diego (US): 281.4/GG14
12. Towards optimal physical therapy after stroke: Predictions from a computational neurorehabilitation model, **CE Han**, MA Arbib, N Schweighofer, 14th Joint Symposium on Neural Computation at CalTech, California (US), 2007 May.
13. Difference in cognition and latency may affect variability in strategy for lateralized reach-to-grasp actions, **CE Han**, J Tretriluxana, J Bonaiuto, N Schweighofer, CJ Winstein, MA Arbib, Society for Neuroscience 2006 at Atlanta (US).
14. Motor cortex map plasticity in motor learning and recovery from stroke: a simulation study, **C Han**, MA Arbib, N Schweighofer, Society for Neuroscience 2005 at Washington DC (US).

INVITED TALKS

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|-------------|--|
| Apr 3 2013 | Department of Medical System Engineering (DMSE), Gwangju Institute of Science and Technology (GIST), Optimal Dose Hypothesis towards individualized therapy for post-strokes |
| Feb 20 2013 | Symposium of Brain and Artificial Intelligence, Hi-One resort, Optimal Dose Hypothesis towards individualized therapy for post-strokes: computational models and clinical supports |
| Feb 2 2013 | Psychiatric Genetic and Neuroimaging Studies: From Basic Concept to Recent Updates, Korea University, Machine learning classification |

Dec 10 2012 Society of the psychiatric neuroimage research, Korea University hospital, Graph theoretical analysis of diffusion weighted MR image

Nov 30 2012 Society of the research of brain-based cognitive language, Korea University hospital, Graph theoretical analysis of diffusion weighted MR image

Oct 23 2012 Computer Science, Seoul National University, BK21, Graph theoretical analysis of structural brain connectivity from diffusion tensor image (DTI)

Oct 8 2012 Psychiatry department, CHA hospital, Graph theoretical analysis of DTI

Feb 27 2012 Computer Science, Dankuk University, Introduction of Computational Neuroscience:
1) Stroke Rehabilitation, 2) Network Science

AWARDS & HONORS

June 2014 **Excellence in Teaching** (Medical Imaging systems for dentistry)
Korea University, Seoul, Republic of Korea

Feb 18 2009 **The most innovative runners-up award** (USC School of Dentistry Research Day)
University of Southern California, Los Angeles, CA

Apr 15 2005 **Outstanding Academic Achievement** (Office of International Services)
University of Southern California, Los Angeles, CA

Feb 14 1998 **Distinguished Service Medal**
By the principal of HanSung Science High School)

Dec 9 1997 **Honor Student of Voluntary Community Works**
By the superintendent of Seoul Metropolitan Office of Education

Mar 1997 ~
Feb 1998 **President of Student Council**
HanSung Science School, Seoul, Republic Korea

The President of The Student Autonomous Dormitory Association
HanSung Science School, Seoul, Republic Korea
Founded the Student Autonomous Dormitory Association

Mar 1995 ~
Feb 1997 **Vice-President of Student Council**
HanSung Science School, Seoul, Republic Korea

WORK EXPERIENCE

July 2000 ~
Aug 2000 **Programmer** in R&D center of Pinewood, Inc., Seoul, South Korea
An online commenting system with Java, Javascript, JSP, JDBC, and mySql

TECHNICAL SKILLS

Programming: MatLab, python, C, C++, Java, VHDL, PERL, NSL, LISP, PDDL, FORTAN, PASCAL

Neuroimaging Tools: FSL, SPM, Freesurfer, TrackVis, and LONI Pipeline.

Can analyze T1 structures, Diffusion Tensor Image (DTI), resting-state fMRI

Network Analysis of Brain Connectome

Operating System: Windows, MacOSX, Linux and SunOS Unix

Parallel Processing with multi-core servers with personal batch system (PBS)

Deep Learning through GPU