

## Seng Bum Yoo

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### Education

- 2015.09 - current    PhD student. Dept. of Brain and Cognitive Sciences, University of Rochester  
• Advisor: Dr. Benjamin Hayden
- 2013.03 - 2015.02    M.Sc., Dept. of Brain and Cognitive Sciences, Seoul National University, South Korea  
• **Thesis title:** Human phoneme perception in Bayesian observer model and probabilistic population code framework  
• Advisor: Dr. Sang-Hun Lee  
• GPA: 4.09 / 4.3 scale (96.9 percentile)
- 2004.03 - 2012.02    B.Sc. (Hons), Dept. of Life Science, Handong Global University, South Korea Double major in biomedical science and psychology  
• GPA: 4.15 / 4.5 scale (95.1 percentile)

### Research Experience

- 2013.03 - 2015.02    M.Sc., Dept. of Brain and Cognitive Sciences, Seoul National University, South Korea  
**Research title:** Human phoneme perception in Bayesian observer model and probabilistic population code framework  
• Plan and design human psychophysics experiment using phonetic stimuli  
• Role in computational modeling  
• fMRI experiment design for speech perception
- 2010.11 - 2011.11    Research assistant, Single Motor Unit laboratory, Dept. of Physical Rehabilitation and Medicine, Rehabilitation Institute of Chicago (RIC), Northwestern University, United States  
**Research title:** Alterations in upper limb muscle synergy structure in chronic stroke survivors  
• Advisors: Dr. William Zev Rymer and Dr. Jinsook Roh  
• Analyzing 16 channel electromyogram 3-D isometric obtained by MACARM  
• Experiment design and collaboration for intra-muscular electromyogram recording setup

- 2005.12 - 2006.12 Undergraduate research assistant, Immune System Lab, Dept. of life science, Handong Global University, South Korea Research title: Enhancement mucosal immunity by Korean Mistletoe Lectin (KML)
- Advisor: Dr. Seong Kyu Song
  - Sample purification of KML, PCR, RNA extraction, immunoassays, blotting

### **Research Interest**

- Influence of action costs for reward-pursuit in dynamic, interactive environment
- How prospection is made in dynamic environment
- Kinematic information, place information, and value combined in decision-making
- Developing a computational model for pursuing reward in dynamic, interactive environment
- Modification of reward pursuit strategies with having social competition
- Irrational or suboptimal decisions made in practical situations

### **Ongoing Research Projects**

- Devising computational model for non-human primate tracking dynamically moving target (Collaborating with Dr. Steven Piantadosi at University of Rochester)
- Exploring neural substrates for decision strategy changes in dorsal Anterior Cingulate Cortex
- Exploring neural substrates related with encoding of place information in dorsal Anterior Cingulate Cortex (Collaborating with Dr. Laurence Hunt at University College of London)
- Developing analysis to find predictive behavior pattern in reward pursuit on dynamically changing environment
- Investigating factor irrational behavior happening in practical life situation ('Dispositional Effect') (Collaborating with Dr. Cary Frydman at University of Southern California)

### **Teaching Experience**

- 2007.03 - 2007.12 Teaching assistant, Dept. of counseling psychology, Handong Global University, South Korea
- Prepare class materials, grading students
  - Search and translate the literature about the system that can be implemented in Korea
- 2006.03 - 2006.12 Teaching assistant, Dept. of life science, Handong Global University, South Korea Course title: Organic chemistry | Biochemistry

## Other Experience

- 2012.09 - 2014.11 Analyst for legislation of sharing economics in health technology, Mark Mount Corp, South Korea
- Analyze regulations and cases about the sharing economies applied in health technologies
  - Write articles and participation in making conference books
- 2008.07 - 2008.08 Research assistant and counselor, Simei Care Center, Singapore Project supervisor: Mr. Francis Goo

## Publications

- Peer-reviewed papers
- Lim DS<sup>\*</sup>, **Yoo SB**<sup>\*</sup>, Chang SE, Lee SL Phoneme Perception as Bayesian Inference with a Narrow-Tuned Multimodal Prior (\* as joint 1st author, in prep)
  - Roh J, Rymer WZ, Perreault EJ, **Yoo SB**, Beer RF (2013) Alterations in upper limb muscle synergy structure in chronic stroke survivors. *Journal of Neurophysiology* 109:768–781.
- Posters
- Lim DS<sup>\*</sup>, **Yoo SB**<sup>\*</sup>, Lee SL Phoneme Perception as Bayesian Inference with a Narrow-Tuned Multimodal Prior (2015) Computational and Systems Neuroscience (CoSyNe)
  - Lim DS<sup>\*</sup>, **Yoo SB**<sup>\*</sup>, Kim JY<sup>\*</sup>, Chang SE, Lee SL A Bayesian Encoding-Decoding Model Account for Phoneme Perception, 2014, Korean Human Brain Mapping society conference
  - Lim DS<sup>\*</sup>, **Yoo SB**<sup>\*</sup>, Kim JY<sup>\*</sup>, Chang SE, Lee SL A Bayesian Model Account for Phoneme Categorization and Discrimination, 2014 Conference of Korean Brain and Cognitive Science
  - **Yoo SB**<sup>\*</sup>, Lim DS<sup>\*</sup>, Chang SE, Lee SL Human phoneme perception in Bayesian observer model and probabilistic population code framework, 2014 Department workshop presentation (2nd prize)
  - Yeom H, Roh J, Yoon U, Yoo SB, Rymer WZ, Beer RF (2012) ECG detection using a convolution wavelet algorithm for denoising of surface EMG. The 2012 *International Conference on Information Science and Technology*. April 28-30, 2012, Shanghai, China
  - Roh J, Rymer WZ, Perreault EJ, Yoo SB, Beer RF Alterations in upper limb muscle synergy structure in chronic stroke survivors. Conference poster. 2011 Society for Neuroscience
- Other professions
- Kwon AR, Seo KS, **Yoo SB** (2013) Guide book of sharing economy, Representative book for conference for sharing economy Seoul, 2013

## **Awards, Scholarships, and Fellowships**

- 2013 - 2015            Brain Korea 21 Graduate student fellowship World Class University  
Graduate student fellowship
- 2007                    Most-valuable project design, LG global challenger competition, LG Corp,  
South Korea (USD \$30,000)
- Project title: developmental plan for organic farming in Korea
  - Top 5 teams over whole Korea (additional USD \$3000)
- 2004 – 2006            Handong Global University Merit-based scholarships (total \$15000)

## **Membership**

- 2013 - current            Member of Korean Human Brain Mapping (KHBM)
- 2011 - current            Member of Society for Neuroscience (SFN)

## **Programming and Techniques**

MATLAB (fluent, coding psychophysics and fMRI experiment, computation modeling, neurophysiology data process) R, SPSS (experienced), PRAAT (experienced with making language related experiments), C (moderate)

## **References**

Dr. Benjamin Hayden

- Assistant professor of Dept. Brain and Cognitive Sciences
- bhayden2@ur.rochester.edu
- Department of Brain & Cognitive Sciences 309 Meliora Hall, University of Rochester  
Rochester, NY 14627

Dr. Steven Piantadosi

- Assistant professor of Dept. Brain and Cognitive Sciences
- spiantadosi@bcs.rochester.edu
- Department of Brain & Cognitive Sciences 307 Meliora Hall, University of Rochester  
Rochester, NY 14627

Dr. William Zev Rymer

- Professor, Dept. of physical rehabilitation and medicine at Northwestern University, research vice-president, sensory motor performance program director
- w-rymer@northwestern.edu
- Rehabilitation Institute of Chicago, 345 E. Superior, suite 1406, Chicago, IL 60611-2654

Dr. Jinsook Roh

- Research advisor as post-doctoral fellow at Northwestern University
- Currently assistant professor of Dept. of kinesiology, Temple University
- jinsook.roh@temple.edu
- Department of kinesiology, 1800 N. Broad Street, 230 Pearson halls, Philadelphia, PA 19122