Broadly I examine the cognitive and neural mechanisms underlying decision-making and self-control. By applying a decision-making framework, I investigate the neural mechanisms underlying psychiatric disorders, especially addictive disorders. I am particularly interested in developing biomarkers of transdiagnostic traits to aid the development of individualized treatment programs. To achieve these goals, I use computational modeling, machine learning techniques, and neuroimaging methods.


Grants & fellowships
Creative-Pioneering Researchers Program, Seoul National University
Sep 2019-Aug 2022
• “Neuro-computational mechanisms of altered decision-making using neuroimaging and machine learning techniques”
• Role: PI

Convergence Research Grant, Seoul National University
Aug 2019-July 2020
• “Elucidating the role of value-based decision-making systems in moral decision making with neuroimaging and machine learning”
• Role: PI

Ministry of Science and ICT of Korea
Apr 2019-Dec 2020
• “Infant-mimic neurocognitive developmental machine learning from interaction experience with real world (BabyMind)”
• Role: Co-I (PI: Byoung-Tak Zhang)

National Research Foundation of Korea
Mar 2018-Feb 2023
• Basic Science Research Program
• “Discovering highly rapid and reliable multi-modal markers for smoking cessation using machine learning”
• Role: PI

National Research Foundation of Korea
Aug 2018-Feb 2021
• Basic Research Laboratory (BRL) Program
• “Integrative Studies on Brain Networks for Working Memory-Decision Making Interaction”
• Role: Co-I (PI: Sang-Hun Lee)

R01 DA021421
Sep 2015-Aug 2020
• “Varieties of impulsivity in opiate and stimulant users”
• Role: Consultant (PI: Jasmin Vassileva)

Seoul Science High School
March 2018-Dec 2018
• Seoul Science High School Research & Education (R&E) Program
• “Predicting choice behavior and individual differences using multi-modal neuroimaging data, computational modeling, and machine learning”
• Role: PI

J. Stewart and Dagmar K. Riley Graduate Fellowship
2010-2011
• College of Arts and Sciences Dissertation Year Research Fellowship, Indiana University
• Fellowship awarded to the most outstanding Ph.D. candidates at Indiana University

NIAID grant for the Women’s Interagency HIV Study (WIHS)
Sep 2010
• PI: Dr. Jasmin Vassileva, University of Illinois at Chicago (UIC)
• Apply cognitive modeling approaches to neurocognitive function in drug addiction and HIV.
• Role: Co-investigator responsible for computational modeling and statistical analyses

Honors and awards
Association for Psychological Science (APS) 2017 Rising Star
Dec 2017
• Presented to outstanding psychological scientists in the earliest stages of their research career post-PhD whose innovative work has already advanced the field and signals great potential for
their continued contributions.

Jack and Linda Gill Outstanding Thesis Award - Honorable Mention  
• Gill Center for Biomolecular Science, Indiana University  
• Selected among graduate students in the Life Sciences from Indiana and Purdue Universities.

GPSO Travel Award  
• Graduate and Professional Student Organization (GPSO), Indiana University

Commendation on Qualifying Examination, Indiana University

William K. Estes Summer Fellowship, Indiana University  
• Fellowship given to a graduate student who does outstanding and rigorous research that encompasses formal or computational approaches to theory.

Travel fellowship to attend Summer Workshop on Decision Neuroscience  
• Hosted by INSEAD and Ross School of Business, University of Michigan

Indiana University College of Arts and Sciences Travel Award

Poster Award for Excellence at the 2nd Indiana Neuroimaging Symposium

Travel award for the IPAM Graduate Summer School, UCLA  
• Probabilistic Models of Cognition: The Mathematics of the Mind

Indiana University Graduate Fellowship

Harvard University Graduate Fellowship

Full-Scholarship from Duk-Myung academic foundation  
• Scholarship for distinguished undergraduates at Seoul National University

Seoul National University Scholarship for Students with Academic Excellence  

**STUDENT AWARDS**

Jaeyeong Yang (graduate)  
Paper Award for Excellence at the Korean Cognitive Science Annual Meeting

Yoonseo Zoh (research assistant)  
Poster Award for Excellence at the Korean Cognitive Science Annual Meeting

Jihyun Hur (research assistant)  
Accepted into the ABCD Workshop on Brain Development and Mental Health Application, University of Oregon, Portland, OR

Harhim Park (graduate)  
SNU Graduate Scholarship for Basic Science Research

Mina Kwon (undergraduate)
The Brain-Mind-Behavior program Research award
Dec 2018

Harhim Park (undergraduate)
SNU Undergraduate Research Grant in Social Sciences
Spring 2018

Harliv Kaur (undergraduate)
NIDA Summer Research Internship ($3,840)
Spring 2017

Julia Parker (undergraduate)
Summer Undergraduate Research Award ($3,500)
Spring 2017

Qiaolan Deng (undergraduate)
Summer Undergraduate Research Award ($3,500)
Spring 2016

Nathaniel Haines (graduate)
Accepted into the 2017 MIND Computational Summer School at Dartmouth
Aug 2017

Nathaniel Haines (graduate)
Selected to attend a workshop on Bayesian estimation of Evidence
Accumulation Models, Boston University, Cambridge, MA
Nov 2016

<table>
<thead>
<tr>
<th>Teaching Experience</th>
<th>Seoul National University</th>
<th>Sep 2017 - Present</th>
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<tbody>
<tr>
<td></td>
<td>Instructor, Psychological Science of Addiction (undergraduate)</td>
<td>Fall 2019</td>
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<tr>
<td></td>
<td>Instructor, Computational modeling (graduate)</td>
<td>Spring 2019</td>
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<tr>
<td></td>
<td>Instructor, Topics in Psychological Sciences (graduate)</td>
<td>Spring 2019</td>
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<tr>
<td></td>
<td>Instructor, Seminar in Psychopathology (graduate)</td>
<td>Fall 2018</td>
</tr>
<tr>
<td></td>
<td>Instructor, Psychological Science of Addiction (undergraduate)</td>
<td>Fall 2018</td>
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<tr>
<td></td>
<td>Guest instructor, Bran-Mind-Behavior (undergraduate)</td>
<td>Spring 2018</td>
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<tr>
<td></td>
<td>Instructor, Computational modeling (graduate)</td>
<td>Spring 2018</td>
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<tr>
<td></td>
<td>Instructor, Seminar in Psychopathology (graduate)</td>
<td>Fall 2017</td>
</tr>
<tr>
<td></td>
<td>Guest instructor, Abnormal Psychology (undergraduate)</td>
<td>Fall 2017</td>
</tr>
</tbody>
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The Ohio State University
Aug 2015 - Aug 2017

- Instructor, Psychological Science of Addiction (undergraduate)
- Instructor, Cognitive and Affective Basis of Behavior (graduate)
- Instructor, Cognitive and Affective Basis of Behavior (graduate)
- Guest instructor, Intro to Bayesian Statistics for Psychological Data (graduate)
- Guest instructor, Quantitative & Statistical Methods (undergraduate)

Indiana University, Bloomington
Aug 2006 - May 2012

- Lab instructor, Neuroimaging Methods and Statistics (undergraduate)
- Instructor, Methods of Experimental Psychology (undergraduate)
- Lab instructor, Advanced Statistics in Psychology I (graduate)
- Teaching Assistant, Statistical Techniques (undergraduate)
- Teaching Assistant, Health Psychology (undergraduate)
- Teaching Assistant, Abnormal Psychology (undergraduate)

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ACADEMIC SERVICE

Editorial Board

- eLife, Reviewing Editor
- Journal of Neuroscience, Associate Editor
- Frontiers in Psychopathology
- Frontiers in Emotion Science

January 2019 - Present
2018 - 2022
October 2014 - Present
March 2015 - Present

Grant review:
- Wellcome Trust, UK
- The Medical Research Council (MRC), UK
- The Research Foundation - Flanders (FWO), Belgium

Manuscript Review (alphabetical order):
- American Journal of Psychiatry
- Assessment
- Archives of Clinical Neuropsychology
- Behavior Research Methods
- Biological Psychiatry
- Biological Psychiatry: Cognitive Neuroscience and Neuroimaging
- Clinical Psychological Science
- Cognition and Emotion
- Cognitive Science
- Current Directions in Psychological Science
- Drug and Alcohol Dependence
- Decision
- eLife
- Emotion
- Frontiers in Emotion Science
- Frontiers in Human Neuroscience
- Frontiers in Decision Neuroscience
- Frontiers in Psychopathology
- Human Brain Mapping
- International Conference on Intelligent Biology and Medicine (ICIBM)
- Journal of Abnormal Psychology
- Journal of Behavioral Decision Making
- Journal of Experimental Psychology: General
- Journal of Mathematical Psychology
- Journal of Neuroscience (Frequent Reviewer in 2015, Outstanding Reviewer in 2017)
- Journal of Neuroscience, Psychology, and Economics
- Nature Human Behaviour
- Neural Networks
- Neuroimage
- Neuroimage: Clinical
- Neuropsychologia
- Nicotine & Tobacco Research
- Oxford Handbook of Computational and Mathematical Psychology
- PLOS ONE
- Personality Neuroscience
- Proceedings of the Cognitive Science Society

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Psychological Assessment
Psychological Science
Psychological Medicine
Psychonomic Bulletin & Review
Schizophrenia Bulletin
Schizophrenia Research
Scientific Reports
Translational Psychiatry

Trainees (Seoul National University)
- Graduate student advisees: Jaeyeong Yang (March 2018-Present), Harhim Park (Sep 2018-Present), Dayeong Min (Sep 2018-Dec 2018), Hyeonjin Kim (Sep 2018-Present), Soyeon Kim (Sep 2018-Present), Mina Kwon (Sep 2019-Present), Jihyun Hur (Sep 2019-Present).
- Lab managers: Jiwon Kim (Jan 2018-Aug 2018), Yoonseo Zoh (Sep 2018-Present)

Trainees (The Ohio State University)

Dissertation/Thesis Committee (Seoul National University)
- Seyeol Kwak (Clinical) Spring 2019
- Bokgyung Shin (Clinical) Spring 2019
- Dahye Kim (Clinical) Spring 2019
- Jungeun Lee (Clinical) Spring 2019
- Yejin Lee (Clinical) Spring 2019
- Hyeonjung Yoon (Social) Spring 2019
- YooHyun Choi (Social) Spring 2019
- Daye Shin (Clinical) Fall 2018
- Mijin Kwon (Cognitive) Fall 2018
- RaiHyung Lee (Neuroscience) Fall 2018
- Seung-Jin Park (Clinical) Fall 2018
- Eunji Shin (Clinical) Spring 2018
- Hojin Lee (Clinical) Spring 2018
- Jichul Kim (Clinical) Spring 2018
- Ilyoung Kim (Clinical) Spring 2018
- Hairin Kim (Clinical) Spring 2018
- Jinhoo Sim (Neuroscience) Spring 2018
- Young-In Chung (Clinical) Fall 2017
- Boram Sun (Clinical) Fall 2017

Dissertation/Thesis Committee (The Ohio State University)
- Anjali Agarwal (Cognitive) Fall 2015
- Anne C. Wilson (Clinical) Fall 2015
- Benjamin Pfeifer (Clinical) Spring 2016
- Aimee Zisner (Clinical) Fall 2016
- Graham Cooper (Clinical) Spring 2017
• Ilana Seager (Clinical) Spring 2017
• Dana E. Kamara (Clinical) Spring 2017
• Patrick Whitmoyer (Clinical) Spring 2017
• Ran Zhou (Cognitive) Spring 2017
• Ziv Bell (Clinical) Spring 2017

Research Award Committee
• Graduate and Professional Student Organization (GPSO), Indiana University Spring 2010

SOFTWARE DEVELOPMENT
• Developed an R package called hBayesDM (hierarchical Bayesian modeling of Decision-Making tasks), which offers hierarchical Bayesian analysis of various computational models on an array of decision-making tasks with a single line of coding. Tutorials and codes are available at https://github.com/CCS-Lab/hBayesDM.

• Developed a package called easyml (easy machine learning), which is a toolkit for easily building and evaluating machine learning models, both in R and Python. Codes are available at https://github.com/CCS-Lab/easyml.

PROFESSIONAL MEMBERSHIPS

REFERENCES
Professor Jerome R. Busemeyer
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Indiana University, Bloomington
Tel: (812) 855-4882
Email: jbusemey@indiana.edu

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Indiana University, Bloomington
Tel: (812) 856-4164
Email: bodonnel@indiana.edu

Professor P. Read Montague
Virginia Tech Carilion Research Institute & University College London
Tel: (540) 526-2006
Email: read@vt.edu

Professor Peter Dayan
Max Planck Institute for Biological Cybernetics at Tübingen
Email: peter.dayan@tuebingen.mpg.de