

## Curriculum Vitae

### Se-Woong Park, PhD

Assistant Professor  
University of Texas at San Antonio  
Department of Kinesiology,  
MB 3.466  
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sewoong.park@utsa.edu

### Education

**Sep. 2008 – Jan. 2014** Doctor of Philosophy in Biology

**Northeastern University**, Boston, MA

Advisor: Dagmar Sternad, Ph.D.

Dissertation title: *Acquisition and retention of asymmetric bimanual skills: Behavioral correlates of neuroplasticity*

**Sep. 2004 - Aug. 2006** Master of Science in Cognitive Science

**Seoul National University**, Seoul, Korea

Advisor: Kyoung-Min Lee, M.D., Ph.D.

Thesis title: *Correlation between phase synchronization of neuronal activity and clinical outcome of deep brain stimulation in patients with Parkinson's disease*

**Mar. 1997 - Aug. 2004** Bachelor of Science in Physics

**Korea Advanced Institute of Science and Technology (KAIST)**, Daejeon, Korea

*Early entrance after completing 2nd-year courses in high school*

Advisor: Hawoong Jeong, Ph.D

Thesis title: *Comparison of the statistical properties in various linguistic networks*

### **Academic Appointments**

- Nov. 2019 – present** Affiliate Faculty Member, the Autism Research Center, University of Texas at San Antonio
- Aug. 2019 - present** Assistant Professor, Department of Kinesiology, University of Texas at San Antonio
- Dec. 2017 – present** Research Affiliate in the Sinha Lab, Brain and Cognitive Sciences, Massachusetts Institute of Technology, Cambridge, MA (PI: Prof. Pawan Sinha)
- Sep. 2017 – May 2019** Associate Research Scientist, Northeastern University, Boston, MA (PI: Prof. Dagmar Sternad)
- Oct. 2017 – Jan. 2019** Consultant in the Hillman Lab, Massachusetts General Hospital Institute of Health Professions (PI: Prof. Robert Hillman)
- Jan. 2014 – Aug. 2017** Postdoctoral Research Associate, Northeastern University, Boston, MA (PI: Prof. Dagmar Sternad)
- Sep. 2008 – Dec. 2013** Research Assistant, Northeastern University, Boston, MA (PI: Prof. Dagmar Sternad)
- Jan. 2007 – Apr. 2008** Research Assistant, the Smith-Kettlewell Eye Research Institute, San Francisco, CA (PIs: Profs. Edward L. Keller and Kyoung-Min Lee)

### **Honors and Awards**

1. Travel Award; Biomechanics and Neural Control of Movement (BANCOM) Conference, Mt. Sterling, OH, June 12-17, 2016
2. Honorable Mention; Graduate Symposium, Biology department, Northeastern University, May 10, 2013
3. Finalist (1<sup>st</sup> runner-up); Research, Innovation and Scholarship Expo in Northeastern University, in Physical and life sciences, graduate level, March 22, 2013
4. Graduate Assistantship; Seoul National University. Fall 2004
5. Merit-based Scholarship; KAIST, Spring 1999

### **Accepted Grant Proposals**

1. 2017 – 2018: NIH-R21-HD089731: Quantification of Predictive Motor Impairments in Individuals with ASD. Principal Investigators: Dagmar Sternad and Pawan Sinha. Included as a key personnel (postdoc) and significant contributions to writing of proposal
2. 2018 Simons Foundation Autism Research Initiative (SFARI) Explorer Award (\$80,000 total):

Principal Investigators: Dagmar Sternad and Pawan Sinha. Significant contributions to writing of proposal

3. 2019-2020 UTSA COEHD Faculty Research Award: Characterizing electroencephalographic changes during complex upper-limb skill acquisition and retention (\$5,000): Se-Woong Park. My role: Principal Investigator

## Publications and Presentations

### Peer-reviewed Journal Articles

1. Crozier, D., Zhang, Z., **Park, S.-W.** & Sternad, D. (2019). Gender Differences in Throwing Revisited: Sensorimotor Coordination in a Virtual Ball Aiming Task. *Frontiers in Human Neuroscience*. 13, 231.
2. Zhang, Z., Guo, D., Huber, M.E., **Park, S.-W.**, & Sternad, D. (2018). Exploiting geometry of solution space to reduce sensitivity to neuromotor noise. *PLoS Computational Biology*. e1006013
3. Van Stan, J.H., **Park, S.-W.**, Jarvis, M., Mehta, D.D., Hillman, R.E., Sternad, D. (2017). Measuring vocal motor skill with a virtual voice-controlled slingshot. *Journal of the Acoustical Society of America*. 142(3), 1199-1212.
4. **Park, S.-W.**, Hogan, N., Marino, H., Charles, S.K., Sternad, D. (2017). Moving slowly is hard for humans: Limitations of dynamic primitives in human motor control. *Journal of Neurophysiology*. 118(1), 69-83.
5. Chu, V.W., **\*Park, S.-W.**, Sanger, T., & Sternad, D. (2016). Children with dystonia can learn a novel motor skill: Strategies that are tolerant to high variability. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 24(8), 847-858.  
\* Corresponding author
6. **Park, S.-W.**, & Sternad, D. (2015). Robust retention of individual sensorimotor skill after self-guided practice. *Journal of Neurophysiology*, 113(7), 2635-2645.
7. **Park, S.-W.**, Dijkstra, T.M.H., & Sternad, D. (2013). Learning to never forget—time scales and specificity of long-term memory of a motor skill. *Frontiers in Computational Neuroscience*, 7, 111.
8. Sternad, D, **Park, S.-W.**, Müller, H., & Hogan, N. (2010). Coordinate dependence of variability analysis. *PLoS Computational Biology*, 6(4), e1000751.
9. Keller, E.L., Lee, K.-M., **Park, S.-W.**, & Hill, JA. (2008). The effect of inactivation of the cortical frontal eye field on saccades generated in a choice response paradigm. *Journal of*

*Neurophysiology*, 100(5), 2726-2737.

### Articles under Review

1. Van Stan: J.H., **Park, S.-W.**, Jarvis, M., Stemple, J., Hillman, R., Sternad, D. Towards the clinical assessment of vocal motor skill: A virtual voice-controlled task based on the Vocal Function Exercises treatment protocol. *Journal of Speech Language Hearing Research* (in Review)

### Articles in Preparation

1. **Park, S.-W.**, Ebert, J., & Sternad, D. Asymmetric learning in an asymmetric bimanual task.
2. **Park, S.-W.**, Cardinaux, A., Crozier, D., Sinha, P., & Sternad, D. Developmental aspects of predictive motor skills.
3. **Park, S.-W.**, Dijkstra, T.M.H., & Sternad, D. Generalization of bimanual polyrhythmic skills.
4. **Park, S.-W.**, Oh, J.S., Ryu, J.K., Lee, J.Y., Lee, K.M., & Sternad, D. Change of variability during virtual throwing in patients with Parkinson's Disease.
5. **Park, S.-W.** & Sternad, D. Persistence and flexibility of motor memory in months and years of time scales.
6. **Park, S.-W.**, Tam, H. & Sternad, D. Spatiotemporal cortical activities during rhythmic and discrete movement.
7. Harrigian, K., Crozier, D., **Park, S.-W.** & Sternad, D. Individual characteristics in discrete and rhythmic timing abilities.

### Peer-reviewed Conference Papers

1. **Park, S.-W.**, Hogan, N., & Sternad, D. (2014). Coordinate invariance of variability analysis: A revised covariation cost analysis. *The 40<sup>th</sup> Annual Northeast Bioengineering Conference*. Boston, MA.

### Poster Presentations

1. **Park, S.-W.**, Cardinaux, A., Guo, D., Sinha, P., & Sternad, D. (2019). Developmental aspects of predictive motor skills. *49<sup>th</sup> Annual Conference of the Society for Neuroscience*, Chicago, IL, USA, October 22.
2. Cahill, A., Zhang, Z., **Park, S.-W.**, & Sternad, D. (2019). Extrinsic Noise Benefits Skill Acquisition and Timing Accuracy. *49<sup>th</sup> Annual Conference of the Society for Neuroscience*, Chicago, IL, USA, October 22.
3. Kim, J.C., **Park, S.-W.**, Sternad, D., & Large, E. (2019). A Dynamical Model of Polyrhythmic Bimanual Coordination: Hebbian Plasticity and Long-Term Retention of Personal Styles. *Society for Music Perception and Cognition*, New York, NY, USA, August 5-7.

4. **Park, S.-W.**, Cardinaux, A., Guo, D., Ben-Ami, S., Denna, L., Chan, K., Sinha, P., & Sternad, D. (2019). Predictive Motor Abilities in Children with Autism Spectrum Disorder: Evidence from Kinematics and Muscle Activity. *International Society of Autism Research (INSAR)*, Montreal, QC, Canada, May 1-4.
5. **Park, S.-W.**, Cardinaux, A., Guo, D., Ben-Ami, S., Denna, L., Sinha, P., & Sternad, D. (2018). Impaired motor abilities during prediction in children with Autism Spectrum Disorder. *Annual Conference of the Society for the Neural Control of Movement (NCM)*, Santa Fe, NM, USA, April 30-May 4.
6. Zhang, Z., Cahill, A., Guo, D., **Park, S.-W.**, & Sternad, D. Throwing is not all about timing: Added noise can enhance tolerance to timing imprecision. *Annual Conference of the Society for the Neural Control of Movement (NCM)*, Santa Fe, NM, USA, April 30-May 4.
7. **Park, S.-W.**, Cardinaux, A., Guo, D., Ben-Ami, S., Sinha, P., & Sternad, D. (2018). Quantification of predictive motor impairments in children with Autism Spectrum Disorder. *International Society for Autism Research (INSAR)*, Rotterdam, Netherlands, May 9-12.
8. **Park, S.-W.**, & Sternad, D. (2017). Time Scales and Specificity of Acquisition, Retention and Generalization of a Novel Motor Skill over Months and Years. *Annual Conference of the Society for the Neural Control of Movement (NCM)*, Dublin, Ireland
9. Zhang, Z., Huber, M., **Park, S.-W.**, & Sternad, D. (2016). Structure of solution space in a redundant motor task determines learning. *46<sup>th</sup> Annual Conference of the Society for Neuroscience*, San Diego, CA, USA
10. **Park, S.-W.**, Tam, H., & Sternad, D. (2016). Practice-induced changes in EEG during asymmetric bimanual skill learning. *46<sup>th</sup> Annual Conference of the Society for Neuroscience*, San Diego, CA, USA
11. **Park, S.-W.**, Tam, H., & Sternad, D. (2016). Practice-induced changes in cortical activity during bimanual skill learning: An EEG study. *Biomechanics and Neural Control of Movement*, Mt. Sterling, OH, USA
12. Van Stan, J.H., Jarvis, M.T., **Park, S.-W.**, Sternad, D., Hillman, R.E., Mehta, D.D. (2015). Development of a two-dimensional virtual environment to study variability in vocal motor learning. *The 11th International Conference on Advances in Quantitative Laryngology*. London, U.K
13. Chu, V.W.T., **Park, S.-W.**, Sanger, T., & Sternad, D. (2015). Dystonic children can learn: improving sensorimotor performance by developing solutions that are tolerant to high variability. *Annual Conference of the Society for the Neural Control of Movement (NCM)*, Charleston, SC, USA

14. Ebert, J., **Park, S.-W.**, Sternad, D. (2015). Asymmetric learning in an asymmetric bimanual task. *Society for Neural Control of Movement*, Charleston, SC, USA
15. **Park, S.-W.**, Stead, C., & Sternad, D. (2015). Increase of interhemispheric coherence during acquisition of asymmetric bimanual movements. *Society for Neural Control of Movement*, Charleston, SC, USA
16. **Park, S.-W.**, Cowenhoven, J., & Sternad, D. (2014) Increase of interhemispheric coherence during acquisition of asymmetric bimanual movements. *44<sup>th</sup> Annual Conference of the Society for Neuroscience*, Washington, DC, USA
17. **Park, S.-W.**, Hogan, N., & Sternad, D. (2014) Coordinate invariance of variability analysis: A revised covariation cost analysis. *40<sup>th</sup> Annual Northeast Bioengineering Conference*, Boston, MA
18. **Park, S.-W.**, Ebert, J., & Sternad, D. (2013) Plasticity of interhemispheric interference in an asymmetric bimanual task. *43<sup>rd</sup> Annual Conference of the Society for Neuroscience*, San Diego, CA, USA
19. **Park, S.-W.**, Ebert, J., & Sternad, D. (2013) Plasticity of interhemispheric interference in an asymmetric bimanual task. *Progress in Motor Control*, Montreal, QC, Canada
20. **Park, S.-W.**, Ebert, J., & Sternad, D. (2013) Plasticity of interhemispheric interference in an asymmetric bimanual task. *Research, Innovation and Scholarship Expo*, Northeastern University, Boston, MA, USA
21. **Park, S.-W.**, Hogan, N., & Sternad, D. (2012) Coordinate invariance of variability analysis: A revised Covariation cost analysis. *42<sup>nd</sup> Annual Conference of the Society for Neuroscience*, New Orleans, LA, USA
22. Ebert, J., **Park, S.-W.**, Griffin, L., O'Neil-Pirozzi, T., & Sternad, D. (2012) Central fatigue in cognitive and motor performance. *Research, Innovation and Scholarship Expo*, Northeastern University, Boston, MA, USA
23. Farjadian, A. B., **Park, S.-W.**, & Sternad, D. (2012) Structure in variability: Searching for coordinate-insensitive methods to characterize motor control. *Research, Innovation and Scholarship Expo*, Northeastern University, Boston, MA, USA
24. **Park, S.-W.**, & Sternad, D. (2012) Learning and retention of a complex bimanual skill. *Research, Innovation and Scholarship Expo*, Northeastern University, Boston, MA, USA
25. **Park, S.-W.**, & Sternad, D. (2011) Individual differences in learning and retention of a complex bimanual skill. *41<sup>st</sup> Annual Conference of the Society for Neuroscience*, Washington DC, USA
26. Farjadian, A. B., **Park, S.-W.**, & Sternad, D. (2011) Performance improvement by optimizing

- error tolerance and covariation but not noise. *41<sup>st</sup> Annual Conference of the Society for Neuroscience*, Washington DC, USA
27. Farjadian, A.B., Geipel, A., **Park, S.-W.**, & Sternad, D. (2011) Improving performance by optimizing error tolerance and covariation but not noise. *Progress in Motor Control*, Cincinnati, OH, USA
28. **Park, S.-W.**, & Sternad, D. (2011) Learning an asymmetric bimanual task: decoupling of rhythmic and discrete movements. *Progress in Motor Control*, Cincinnati, OH, USA
29. **Park, S.-W.**, Dijkstra T.M.H., & Sternad D. (2010) Generalization of learning and retention of a polyrhythmic bimanual skill. *40<sup>th</sup> Annual Conference of the Society for Neuroscience*, San Diego, CA, USA
30. **Park, S.-W.**, Dijkstra T.M.H., & Sternad D. (2009) Learning of polyrhythmic synchronization in bimanual coordination and its retention after 8 years. *39<sup>th</sup> Annual Conference of the Society for Neuroscience*, Chicago, IL, USA
31. **Park, S.-W.**, Dijkstra T.M.H., & Sternad D. (2009) Dynamics of a complex bimanual task during practice and long-term retention. *Progress on Motor Control*, Marseille, France
32. **Park, S.-W.**, Dijkstra T.M.H., & Sternad D. (2009) Dynamics of a complex bimanual task during practice and long-term retention. *Dynamics Days: International Conference on Chaos and Nonlinear Dynamics*, San Diego, CA, USA
33. Keller, E.L., Hill, J.A., **Park, S.-W.**, & Lee, K.-M. (2008) Reversible inactivation of the cortical frontal eye fields: Effect on saccades generated by recall from associative memory. *38<sup>th</sup> Annual Conference of the Society for Neuroscience*, Washington DC, USA
34. **Park, S.-W.**, Lee, K.-M., Lim, Y.H., Kim, H.J., Paek, S.H., & Jeon, B.S. (2006) Correlation between phase synchronization of neural activity and the clinical outcome of deep brain stimulation in patients with Parkinson's disease. *28<sup>th</sup> Annual Meeting of the Korean Neurological Association*. Seoul, Korea
35. Heo, J.H., Seol, J.H., **Park, S.-W.**, Kang, B.S., & Lee, K.-M. (2006) Violation of listing's law in patients with central and peripheral diplopia. *9<sup>th</sup> Annual Meeting of the Korean Society for Brain and Neural Sciences*. Seoul, Korea
36. Woo, S.H., **Park, S.-W.**, & Lee, K.-M. (2006) Spatiotemporal pattern of brain activity during unilateral finger movement. *9<sup>th</sup> Annual Meeting of the Korean Society for Brain and Neural Sciences*. Seoul, Korea
37. **Park, S.-W.**, Lee, K.-M., Lim, Y.H., Kim, H.J., Woo, S.H., Paek, S.H., & Jeon, B.S. (2006) Correlation between phase synchronization of neural activity in patients with Parkinson's

disease and the clinical outcome of deep brain stimulation. *Dynamics Days: International Conference on Chaos and Nonlinear Dynamics*, Bethesda, MD, USA

### **Oral Presentations**

1. **Park, S.W.**, Cardinaux, A., Guo, D., Ben-Ami, S., Denna, L., Sinha, P., & Sternad, D. Characterizing predictive motor impairments in time and space in children with Autism Spectrum Disorder. New England Sequence and Timing (NEST), Apr. 2018, Storrs, CT, USA
2. **Park, S.-W.**, & Sternad, D. Robust retention of sensorimotor timing in a polyrhythmic task. New England Sequence and Timing (NEST), Mar. 2015, Amherst, MA, USA
3. **Park, S.-W.** Learning to never forget: Specificity of motor memory. Graduate Symposium, Biology department, Northeastern University. May, 2013, Nahant, MA, USA

### **Invited Talks**

1. Quantification of complex motor behavior and its clinical applications. Daegu Gyeongbuk Institute of Science and Technology. July 2019.
2. Understanding Complex Human Motor Control and Learning in Health and Disease. Sungkyunkwan University. July 2019.
3. Interpretation and quantification of motor variability. Institute of Cognitive Sciences, Seoul National University. December 2017.
4. Acquisition, retention and generalization of asymmetric bimanual skills: Behavioral correlates of neuroplasticity. Sinha Lab, MIT. October 2015
5. An interdisciplinary approach to motor control and learning. Institute of Cognitive Sciences, Seoul National University. June 2015
6. What does our brain remember and forget? Specificity of motor memory. Institute of Cognitive Sciences, Seoul National University. August 2014
7. Learning to never forget: Specificity of motor memory. PRISM lecture, Northeastern University, May 2014
8. Noise, covariation and tolerance to error in learning a motor task. Department of Physical Education, Seoul National University. June 2011

### **Additional Training and Summer Schools**

Intensive Course in Transcranial Magnetic Stimulation (TMS), Feb. 25 - Mar. 1, 2013, Harvard



Medical School, Boston, MA, USA

The 8<sup>th</sup> Motor Control Summer School, June 9 - 13, 2010, Bolivar, PA, USA

Neural Control and Biomechanics of Movement, graduate course 3.183 at MIT taught by Prof. Neville Hogan. Spring 2009. Grade: A (not recorded in NU transcript)

### **Teaching Experience**

Fall 2020	Motor Learning (KIN 4403), UTSA, class size: 210
Spring 2020	Foundations of Kinesiology (KIN 2303), UTSA, class size: 71
	Motor Development (KAH 6213), UTSA, class size: 15
Fall 2019	Foundations of Kinesiology (KIN 2303), UTSA, class size: 98
August 6 <sup>th</sup> , 2016	Summer School in Computational Sensory-Motor Neuroscience, Teaching assistant of Dagmar Sternad, University of Minnesota, Minneapolis
May 2014	Proactive Recruitment in Introductory Science and Mathematics (PRISM) graduate student mentor, Northeastern University
May 2013	PRISM graduate student mentor, Northeastern University
May 2012	PRISM graduate student mentor, Northeastern University
May 2011	PRISM graduate student mentor, Northeastern University
Sep. 2010 – Apr. 2011	Teaching Assistant in Biology, Northeastern University Subject: General Biology Lab I (undergraduate level)
Sep. 2005 - Dec. 2005	Teaching Assistant in Cognitive Science Program/Department of Neurology, Seoul National University Subject: Cognitive Dysfunction (graduate level)

### **Mentoring**

Masters student in Kinesiology at UTSA:

Javier Moreno (Fall 2019)

Remington Angel (Spring 2020 – present)

Syiece Bowie (Spring 2020 – present)

Christina Jimenez (Summer 2020 – present)

PhD student at UTSA:

Suzanne Byrne (Spring 2020 – present)

Masters student in Biology at Northeastern University:

Nick Korsantia (Fall 2013-Summer 2016)

Undergraduate students from Northeastern University:

Leo Byun (Fall 2010-Spring 2011)

Julia Ebert (Fall 2011-Spring 2015), Recipient of Goldwater Fellowship and Marshall fellowship

Julia Cowenhoven (Spring 2014), Recipient of Undergraduate Research Grant

Courtney Stead (Fall 2014-Spring 2015), Recipient of Undergraduate Research Grant

Hannah Tam (Fall 2015-present), Recipient of Goldwater Fellowship and Undergraduate Research Grant

Kathleen Owens (Fall 2015-Fall 2016)

Dena Guo (July 2016-Summer 2018)

Lynnsey Martin (Fall 2016 – Spring 2018)

Jeffrey Zhu (Fall 2017-present)

Abigail Cahill (Summer 2018 - present)

Meredith Young (Fall 2018 – Spring 2019)

Sabrina Bond (Spring 2019)

Luis Bechara (Spring 2019)

Undergraduate student from MIT:

Charlie Andrews (Fall 2015)

Albert Gerovitch (Spring 2018-present)

Annie Abay (Spring 2018)

## **Professional Services**

### **Ad-hoc Reviewer**

Journal of Motor Behavior

Journal of Neurophysiology

Scientific Reports

Attention, Perception & Psychophysics

Human Movement Science

### **Conference volunteer**

40<sup>th</sup> Annual Northeast Bioengineering Conference. Apr. 2014, Boston, MA

9th Annual Meeting of the Korean Society for Brain and Neural Sciences. Nov. 2006, Seoul, Korea.

### **Conference Paper Reviewer**

The 6th International Conference on Biomedical Engineering and Biotechnology. Oct. 2017, Guangzhou, China.

## **Leadership, Service and Outreach**

Volunteering weekly outreach at Living Laboratory, the Museum of Science, Boston, MA. Oct. 2017 – May 2018

*My role: Designing experiments run at the museum, analyzing data from approx. 400 participants, supervising undergraduate volunteers*

Volunteering Unruly Art event, Nov.18, 2016 and Nov. 29, 2017, Joseph Lee K-8 School, Boston, MA

*My role: Helping children (4-13-year-old) that needs special care during art class.*

Lab demonstration for Driscoll School (Brookline, MA, 2012, 2016 and 2017) and Citizen Schools (Chelsea, MA, 2016)

*My role: Explaining and demonstrating EEG experiment to 7-8<sup>th</sup> grade students*

Organizing Haiti Benefit Concert, Apr. 26, 2014, the Fenway Center, Boston, MA, USA

*My role: Administrating a benefit concert for Haiti*

Missionary trips to Haiti, Dec. 3-10, 2011 and Sep. 1-8, 2012, Cap-Haitien, Haiti

*My role: Helping orphans and elderly people who need special assistance, outreaching to families who need food*

President, Korean Graduate Student Association, Northeastern University, May 2010 – Apr. 2011

*My role: Organizing meetings, maintaining the student organization*

## **Membership**

Society for Neuroscience

Society for the Neural Control of Movement

American Physiological Society (Regular Member 2017)

International Society for Autism Research

## References

**Dagmar Sternad, Ph.D.**

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**Neville Hogan, Ph.D.**

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