

# SOOK-LEI LIEW, PHD, OTR/L

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## EMPLOYMENT

- 2015-present**      **Assistant Professor**  
Chan Division of Occupational Science & Occupational Therapy,  
Division of Biokinesiology & Physical Therapy, Ostrow School of Dentistry  
Department of Neurology, Keck School of Medicine  
Faculty, Neuroscience Graduate Program  
Affiliate, Mark and Mary Stevens Neuroimaging and Informatics Institute  
University of Southern California
- 2015 – present**      **Director**  
Neural Plasticity and Neurorehabilitation Laboratory  
University of Southern California

## EDUCATION & TRAINING

- 2012-2014**      **Postdoctoral Fellow**  
Human Cortical Physiology & Stroke Neurorehabilitation Section  
National Institute of Neurological Disorders and Stroke, National Institutes of Health  
Advisor: Dr. Leonardo Cohen
- 2014**      **Visiting Research Fellow**  
Human Brain Physiology and Stimulation Laboratory  
Department of Physical Medicine and Rehabilitation  
Johns Hopkins School of Medicine  
Advisor: Dr. Pablo Celnik
- 2013**      **Visiting Research Fellow**  
Applied Neurotechnology Laboratory  
Institute of Medical Psychology and Behavioral Neurobiology  
University of Tübingen  
Advisor: Dr. Niels Birbaumer & Dr. Surjo Soekadar
- 2008-2012**      **Ph.D.**  
Division of Occupational Therapy & Occupational Science, concentration in  
Cognitive Neuroscience  
The Brain and Creativity Institute  
University of Southern California  
Advisor: Dr. Lisa Aziz-Zadeh
- 2006-2008**      **M.A. in Occupational Therapy**  
Division of Occupational Therapy & Occupational Science  
University of Southern California
- 2002-2006**      **B.A. in Kinesiology, B.A. in English, magna cum laude**  
Department of Kinesiology, concentration in Sports Medicine  
Department of English  
Rice University

## GRANTS & FELLOWSHIPS

- 2017**                    **US Army – Army Research Office**  
Title: "Cortically Coupled Computing for Augmented Reality"  
Period of Support: September 2017 to August 2018  
Total Offered: \$1,100,000  
PI: David Krum, PhD  
Role: Co-PI
- 2017**                    **National Science Foundation (NSF) SBIR Phase I**  
NSF Award #1721266  
Title: "Augmented Reality for Arm and Hand Rehabilitation Post-stroke"  
Period of Support: July 2017 to June 2018  
Total Offered: \$224,916  
PI: Behrad Moeinzadeh, PhD  
Role: Consultant
- 2017**                    **National Institutes of Health (NIH) K01 Career Development Grant**  
K01HD091283  
Title: "Big Data Neuroimaging to Predict Motor Behavior After Stroke"  
Period of Support: April 2017 to December 2020  
Agency: NIH/NICHD/NCMRR  
Total Offered: \$532,764  
PI: Sook-Lei Liew, PhD, OTR/L
- 2016**                    **NIH Center for Large Data Research and Data Sharing in Rehabilitation (CLDR)**  
P2CHD06570  
Pilot Grant for Large Scale Data Archiving  
Title: "ATLAS: Anatomical Tracings of Lesions after Stroke"  
Period of Support Offered: December 2016 to June 2017  
Agency: CLDR, funded by NIH NIBIB, NINDS, NCMRR  
Total Offered: \$10,000  
PI: Sook-Lei Liew, PhD, OTR/L
- 2016**                    **American Heart Association (AHA) National Innovative Research Grant**  
16IRG26960017  
Title: "REINVENT: A Closed-Loop VR Neurofeedback System for Motor Recovery after Severe Stroke"  
Period of Support Offered: January 2016 to December 2017  
Agency: American Heart Association  
Total Offered: \$149,446  
PI: Sook-Lei Liew, PhD, OTR/L
- 2016**                    **NIH BD2K Centers Coordination Center Hackathon Grant**  
Title: "Brainhack LA 2016: Big Data Tools for Connectomics"  
Period of Support Offered: 2016  
Agency: NIH/BD2KCCC  
Total Offered: \$3,000  
PI: Sook-Lei Liew, PhD, OTR/L

**2015**                    **NIH K12 Grant: Rehabilitation Research Career Development Program**  
K12 HD 055929  
Title: "Noninvasive Brain Stimulation and Neuroimaging to Characterize and Stimulate Recovery after Stroke"  
Period of Support Offered: January 2015 to August 2020  
Agency: NIH/NICHD/NCMRR, NIH/NINDS  
Total Offered: ~\$375,000  
PI: Kenneth J. Ottenbacher, Ph.D., OTR/L  
Role: Scholar

**2014**                    **NIH NINDS Intramural Competitive Fellowship Award**  
Title: "Real-time fMRI Neurofeedback for Motor Recovery after Stroke"  
Period of Support Offered: May 2014 to April 2017  
Agency: NINDS/NIH  
Total Offered: ~\$147,660  
PI: Sook-Lei Liew

**2013**                    **German Academic Exchange Service (DAAD) Research Grant**  
Title: "Real-time fMRI Neurofeedback for Motor Recovery After Stroke"  
Period of Support: September 2013 to October 2013  
Agency: German Academic Exchange Service (DAAD)  
Total: \$3,000  
PI: Sook-Lei Liew

**2009-2012**            **National Science Foundation Graduate Research Fellowship**  
NSF Award #2009072048  
Period of Support: August 2009 to July 2012  
Agency: National Science Foundation  
Total: ~\$124,000  
PI: Sook-Lei Liew

**2008-2010**            **University of Southern California Provost's Ph.D. Fellowship**  
Period of Support Offered: June 2008 to May 2010  
Agency: University of Southern California  
Total Offered: ~\$120,000  
PI: Sook-Lei Liew

**2008**                    **National Science Foundation East Asia & Pacific Summer Institute**  
Title: "Cultural Effects on the Neural Substrates for Empathy"  
NSF Award #0813067  
Period of Support: June 2008 to May 2009  
Agency: National Science Foundation  
Total: \$5,637  
PI: Sook-Lei Liew

## **AWARDS & HONORS**

**2017**                    **Award**, Special Jury Recognition for Innovative Use of Virtual Reality Technology in the Field of Health, South by Southwest (SXSW) Interactive VR Festival

- 2017** **Scholar**, NIH Loan Repayment Program Renewal Awardee for Clinical Research
- 2016** **Fellow**, American Heart Association Research Leaders Academy
- 2015** **Scholar**, NIH Loan Repayment Program Awardee for Clinical Research
- 2015** **Fellow**, Training in Grantsmanship for Rehabilitation Research (TIGRR) Workshop
- 2012** **Award**, USC Penelope Louise Richardson Award for outstanding potential in fulfilling the role of a faculty member
- 2012** **Awards**, USC Provost PhD Travel Award; OT Division Leadership Travel Award
- 2011** **Fellow**, FENS-IBRO Imaging Training Center, Lausanne/Geneva, Switzerland
- 2011** **Fellow**, UCLA Advanced Neuroimaging Training Program (NITP) Summer Course, Los Angeles, CA
- 2010** **Fellow**, Riken Brain Science Institute Summer Program, Tokyo, Japan
- 2010** **Chair**, National Science Foundation East Asia and Pacific Summer Institutes Alumni Panel, Washington D.C.
- 2008, 2011, 2012** **First Place**, USC School of Dentistry Research Day, Occupational Science Division
- 2009, 2010** **Second Place**, USC School of Dentistry Research Day, Occupational Science Division
- 2009** **Fellow**, Summer Institute in Cognitive Neuroscience, Santa Barbara, CA
- 2008** **Fellow**, National Science Foundation East Asia and Pacific Summer Institutes
- 2008** **Award**, USC Elizabeth June Yerxa Award for Excellence in Research
- 2008-2009** **Award**, USC Graduate Professionalism Initiative
- 2006-2008** **Scholarships & Honors (Masters Degree)**, Asia Pacific Occupational Therapy Congress (APOTC) Travel Award, Hong Kong, 2008; International Society of Occupational Science Student Delegate, 2007; Phi Theta Epsilon (National Occupational Therapy Honor Society), 2007-2008
- 2002-2006** **College Scholarships & Honors (Bachelors Degree)**, National Merit Scholarship, Freeman ASIA Scholarship, Target All-Around Scholarship, Rice University Humanities Scholarship, Rice University President's Honor Roll, Rice Academic Fellow, National Society of Collegiate Scholars

**PUBLICATIONS** (\* denotes equal contributions; \*\* denotes senior/corresponding author)

- Liew, S.-L.\*,\*\***, Anglin, J.M\*, Banks, N.W., Sondag, M., Ito, K.L., Kim, H., Chan, J., Ito, J, Jung, C., Lefebvre, S., Nakamura, W., Saldana, D., Schmiesing, A., Tran, C., Vo, D., Ard, T., Heydari, P., Kim, B., Aziz-Zadeh, L., Cramer, S.C., Liu, J., Soekadar, S., Nordvik, J.-E., Westlye, L.T., Wang, J., Winstein, C.J., Yu, C., Ai, L., Koo, B., Craddock, R.C., Milham, M., Lakich, M., Pienta, A., & Stroud, A. (2017) The Anatomical Tracings of Lesions After Stroke (ATLAS) Dataset – Release 1.1. *bioRxiv*, doi: 10.1101/179614
- Dayan, E., Lopez-Alonso, V., **Liew, S.-L.**, & Cohen, L. (2017). Distributed cortical structural properties contribute to motor cortical excitability and inhibition. *bioRxiv*, doi: 10.1101/178301.
- Ito, K., Anglin, J., Kim, H., & **Liew, S.-L.\*\*** (2017). Semi-automated robust quantification of lesions (SRQL) Toolbox. *Research Ideas and Outcomes*, doi: 10.3897/rio.3.e13395.
- Sprugnoli, G., Rossi, S., Emmerdorfer, A., Rossi, A., **Liew, S.-L.**, Tatti, E., di Lorenzo, G., Pascual-Leone, A., & Santarnecchi, E. (2017). Neural correlates of Eureka moment. *Intelligence*, 62, 99-119, doi: 10.1016/j.intell.2017.03.004.
- Anglin, J., Sugiyama, T., & **Liew, S.-L.\*\*** (2017). Visuomotor adaptation in head-mounted virtual reality versus conventional training. *Scientific Reports*, 7, doi: 10.1038/srep45469.
- Lefebvre, S., & **Liew, S.-L.\*\*** (2017). Anatomical parameters of tDCS to modulate the motor system after stroke: A review. *Frontiers in Neurology*, 8, doi: 10.3389/fneur.2017.00029.
- Sainburg, R., **Liew, S.-L.**, Frey, S., & Clark, F. (2017). Promoting translational research between movement science, occupational science, and occupational therapy. *Journal of Motor Behavior*, 49(1), 1-7.
- Sugiyama, T., & **Liew, S.-L.\*\*** (2017). The effects of sensory manipulations on motor behavior: From

- basic science to clinical rehabilitation. *Journal of Motor Behavior*, 49(1), 67-77.
- Ito, K., & **Liew, S.-L.\*\*** (2016). Calculating the laterality index using FSL for stroke neuroimaging data. *GigaScience*, 5, 14-15. doi: 10.1186/s13742-016-0147-0-n
- Kan, E., Anglin, J., Borich, M., Jahanshad, N., Thompson, P., & **Liew, S.-L.\*\*** (2016). Facilitating big data meta-analyses for clinical neuroimaging through ENIGMA wrapper scripts. *GigaScience*, 5, 17-19. doi: 10.1186/s13742-016-0147-0-p
- Craddock R, S. Margulies D, Bellec P, Nolan Nichols B, Alcauter S, A. Barrios F, Burnod Y, J. Cannistraci C, Cohen-Adad J, De Leener B, Dery S, Downar J, Dunlop K, R. Franco A, Seligman Froehlich C, J. Gerber A, S. Ghosh S, J. Grabowski T, Hill S, Sólón Heinsfeld A, Matthew Hutchison R, Kundu P, R. Laird A, **Liew S-L**, J. Lurie D, G. McLaren D, Meneguzzi F, Mennes M, Mesmoudi S, O'Connor D, H. Pasaye E, Peltier S, Poline J-B, Prasad G, Fraga Pereira R, Quirion P-O, Rokem A, S. Saad Z, Shi Y, C. Strother S, Toro R, Q. Uddin L, D. Van Horn J, W. Van Meter J, C. Welsh R, Xu T. (2016) Brainhack: A collaborative workshop for the open neuroscience community. *GigaScience* 5:1-8.
- Buch, E.\*, **Liew, S.-L.\***, & Cohen, L. (2016). Plasticity of sensorimotor networks: Multiple overlapping mechanisms. *The Neuroscientist*, doi:10.1177/1073858416638641
- Liew, S.-L.**, Rana, M., Cornelsen, S., Furtunato de Barros Filho, M., Birbaumer, N., Sitaram, R., Cohen, L., & Soekadar, S. (2016). Improving motor cortico-thalamic communication after stroke using real-time fMRI connectivity-based neurofeedback. *Neurorehabilitation and Neural Repair*, 30(7), 671-675.
- Liew, S.-L.**, Santarnecchi, E., Buch, E. & Cohen, L. (2014). Noninvasive brain stimulation (NIBS) in neurorehabilitation: Local and distant effects for motor recovery. *Frontiers in Human Neuroscience*, 8, 378. [Special Issue on Neurorehabilitation & Neuroplasticity edited by Dr. Edward Taub]
- Liew, S.-L.**, Agashe, H., Bhagat, N., Paek, A., & Bulea, T.C. (2013). A clinical roadmap for brain-neural machine interfaces: Trainees Perspectives on the 2013 International Workshop. *Pulse IEEE*, 4(5), 44-48.
- Liew, S.-L.**, Sheng, T., Margetis, J. & Aziz-Zadeh, L. (2013). Both novelty and expertise increase action observation network activity. *Frontiers in Human Neuroscience*, 7, 541.
- Garrison, K.A., Wong, S., **Liew, S.-L.**, Aziz-Zadeh, L., & Winstein, C. (2013) Modulating the motor system by action observation after stroke. *Stroke*. doi: 10.1161/STROKEAHA.113.001105
- Liew, S.-L.** Sheng, T. & Aziz-Zadeh, L. (2013). Experience with an amputee modulates one's own sensorimotor regions during action observation. *Neuroimage*, 69, 138-145. doi:10.1016/j.neuroimage.2012.12.028
- Liew, S.-L.** & Aziz-Zadeh, L. (2012). The mirror neuron system, social control, and language. [Book chapter]. In: *Handbook of Neurosociology*. Editor: Franks, D. & Turner, J.H.
- Liew, S.-L.**, Garrison, K., Werner, J., & Aziz-Zadeh, L. (2012). The mirror neuron system: Innovations and implications for occupational therapy. *OTJR: Occupation, Participation, and Health*. doi: 10.3928/15394492-20111209-01
- Aziz-Zadeh, L., **Liew, S.-L.**, & Dandekar, F. (2012). The neural correlates of visual creativity. *Social Cognitive Affective Neuroscience*, 8(4), 475-80.
- Johnson, A., **Liew, S.-L.**, & Aziz-Zadeh, L. (2011). Demographics, learning, and imitation, and body schema in Body Integrity Identity Disorder. *Indiana University Undergraduate Journal of Cognitive Science*, 6:8-15. [Mentored undergraduate]
- Aziz-Zadeh, L., Sheng, T., **Liew, S.-L.**, & Damasio, H. (2011). Understanding otherness: The neural basis of action understanding and empathy in a congenital amputee. *Cerebral Cortex*, 22(4), 811-9. doi:10.1093/cercor/bhr139
- Liew, S.-L.**, & Aziz-Zadeh, L. (2011). The neuroscience of language in occupations: A review of findings from brain and behavioral sciences. *Journal of Occupational Science*, 18(2), 97-114.
- Liew, S.-L.** & Aziz-Zadeh, L. (2011). The mirror neuron system and social cognition. [Book chapter]. In: *From DNA to Social Cognition*. Editors: Ebstein, Shamay-Tsoory, & Chew.
- Liew, S.-L.**, Ma, Y., Han, S., & Aziz-Zadeh, L. (2011). Who's afraid of the boss: Cultural differences in social hierarchies modulate self-face recognition in Chinese and Americans. *PLoS ONE* 6(2): e16901. doi:10.1371/journal.pone.0016901
- Liew, S.-L.**, Han, S., & Aziz-Zadeh, L. (2011). Familiarity modulates mirror neuron and mentalizing regions during intention understanding. *Human Brain Mapping*. 32, 1986-1997. doi: 10.1002/hbm.21164

## INVITED TALKS

- Liew, S.-L.** (2017, September). Motor learning strategies and measurement. 7<sup>th</sup> International Symposium on Gait & Balance in Multiple Sclerosis: Neuroplasticity and Rehabilitation in MS. Portland, OR.
- Liew, S.-L.** (2017, July). Neuroimaging and Neuromodulation to Promote Motor Recovery after Stroke. Grand Rounds. Cedars Sinai Medical Center, Los Angeles, CA.
- Liew, S.-L.** (2017, June). Chair, Oral session on Neuroinformatics. Organization for Human Brain Mapping, Vancouver, Canada.
- Liew, S.-L.** (2017, June). ENIGMA Stroke Recovery Updates. ENIGMA Chairs Annual Meeting – Data Blitz, Vancouver, Canada.
- Liew, S.-L.** (2017, May). Neuroimaging and Neuromodulation to Promote Motor Recovery after Stroke. Grand Rounds. Rancho Los Amigos, Downey, CA.
- Liew, S.-L.** (2017, April). Occupational Therapy, Virtual Reality and the Brain. Medicine X | ED. Stanford, CA.
- Liew, S.-L.** (2017, March). Virtual Reality and the Brain. Panel discussion. South By Southwest (SXSW). Austin, TX.
- Liew, S.-L.** (2017, March). Virtual Reality and the Brain. Panel discussion. IEEE Virtual Reality Conference. Los Angeles, CA.
- Liew, S.-L.,** Jahanshad, N., Anglin, J., Borges, V., Heydari, P., et al., (2017, February). Effects of lesion laterality on post-stroke motor ability: An ENIGMA Stroke Recovery analysis. *International Stroke Conference*, Houston, TX.
- Liew, S.-L.** (2017, February). Large scale neuroimaging and neuromodulation to promote motor recovery after stroke. USC Biomedical Engineering Department Seminar. Los Angeles, CA.
- Liew, S.-L.** (2016, November). 'Big data' for rehabilitation: Promises, pitfalls, and future potential. Invited oral symposium (chair and speaker). American Society for Neurorehabilitation. San Diego, CA.
- Liew, S.-L.** (2016, September). Big data neuroimaging and neuromodulation to promote motor recovery after stroke. Invited oral presentation, Medical University of South Carolina, Charleston, SC.
- Liew, S.-L.** (2016, July). New and emerging technologies for clients with motor impairments due to neurological injury. Invited oral presentation, California Board of Occupational Therapy Annual Practice Forum, Los Angeles, CA.
- Liew, S.-L.** (2016, July). Transcranial electrical stimulation: Methods and applications. Invited oral presentation, USC Noninvasive Brain Stimulation Methods Course, Los Angeles, CA.
- Liew, S.-L.,** (2016, June). ENIGMA Stroke Recovery. Invited oral presentation, ENIGMA Leaders Planning Meeting, Geneva, Switzerland.
- Liew, S.-L.,** (2016, June). Brain imaging, noninvasive brain stimulation and virtual reality for stroke rehabilitation. Invited oral presentation, MindMaze, Lausanne, Switzerland.
- Liew, S.-L.,** (2016, June). Brain imaging, noninvasive brain stimulation and virtual reality for stroke rehabilitation. Invited oral presentation, Payoff, Irvine, California.
- Liew, S.-L.** (2016, May). ENIGMA Stroke Recovery: Using big data neuroimaging to predict motor recovery. Invited oral presentation. OT Summit of Scholars, Pittsburgh, PA.
- Liew, S.-L.** (2016, March). ENIGMA Stroke Recovery. Invited oral presentation. USC Imaging Genetics Center, Los Angeles, CA.
- Liew, S.-L.** (2015, October). Brain computer interfaces and real-time fMRI for neurorehabilitation. Invited oral presentation, USC Neuroimaging and Informatics Program, Los Angeles, CA.
- Liew, S.-L.** (2015, July). New and emerging technologies for clients with motor impairments due to neurological injury. Invited oral presentation, USC SOTI Program, Los Angeles, CA.
- Liew, S.-L.,** Thompson, T., Ramirez, J.J., Butcher, P., Cohen, L., Taylor, J.A., & Celnik, P.A. (2015, May). Anodal Transcranial Direct Current Stimulation of Dorsolateral Prefrontal Cortex and Cerebellum Enhance Visuomotor Adaptation. Invited oral presentation, OT Summit of Scholars, Los Angeles, CA.
- Liew, S.-L.** (2015, March). Neuromodulation of the human motor system and implications for stroke rehabilitation. Keynote Speaker, School of Dentistry Research Day, University of Southern California, Los Angeles, CA.

- Liew, S.-L.** (2015, February). Neuromodulation of the human motor system in healthy individuals and individuals after stroke. Biokinesiology Neurorehabilitation Seminar Faculty Tutorial, University of Southern California, Los Angeles, CA.
- Liew, S.-L.** (2015, February). Neuromodulation of the human motor system to enhance learning. Invited presentation, Center of Excellence for Visual and Neurocognitive Rehabilitation, Emory University/Atlanta VA, Atlanta, Georgia.
- Liew, S.-L.,** Thompson, T., Ramirez, J.J., Butcher, P., Cohen, L., Taylor, J.A., & Celnik, P.A. (2014, December). Anodal tDCS of prefrontal cortex and cerebellum enhance different aspects of motor learning in a visuomotor adaptation task. Invited oral presentation, Sensorimotor Research Day, Johns Hopkins University, Baltimore, MD.
- Liew, S.-L.,** Gonzalez-Castillo, J., Horovitz, S., Roopchansingh, V., Tinaz, S., Hallett, M., & Cohen, L.G. (2014, May). Using neurofeedback from real-time fMRI connectivity patterns to enhance skilled motor performance. Invited oral presentation. OT Summit of Scholars, Philadelphia, PA.
- Liew, S.-L.,** Soekadar, S., & Cohen, L. (2014, April). Brain computer interfaces (BCIs) for neurorehabilitation: Evidence and applications for occupational therapy. Invited short course, American Occupational Therapy Association Annual Meeting, Baltimore, MD.
- Liew, S.-L.** (2014, April). *New and emerging technologies for clients with motor impairments due to neurological injury.* Invited presentation for Occupational Therapy Lunch with a Scholar, Johns Hopkins University, Baltimore, MD.
- Liew, S.-L.** (2014, February). *New and emerging technologies for clients with motor impairments due to neurological injury.* Invited alumni presentation, University of Southern California, Los Angeles, CA.
- Liew, S.-L.** (2014, February). *Modulating the motor network in healthy individuals and after stroke.* Invited presentation, University of Southern California, Los Angeles, CA.
- Liew, S.-L.** (2014, February). *Modulating the motor network in healthy individuals and after stroke.* Invited presentation, Washington University School of Medicine, St. Louis, MO.
- Liew, S.-L.** (2013, December). *Modulating the motor network in healthy individuals and after stroke.* Invited presentation, University of Washington, Seattle, WA.
- Liew, S.-L.** (2013, August). *Modulating the motor network in healthy individuals and after stroke.* Invited presentation, The Ohio State University, Columbus, OH.
- Liew, S.-L.** (2013, April). *Engaging the action observation network in healthy controls and individuals with stroke.* Invited presentation, Dr. Pablo Celnik, Johns Hopkins University, Baltimore, MD.
- Liew, S.-L.** (2013, April). *Stroke and the action observation network.* Invited presentation, American Occupational Therapy Association Annual Meeting, San Diego, CA.
- Liew, S.-L.** (2013, March). *New advances in stroke research.* Invited presentation, UCLA Southern California Stroke Recovery Group, Los Angeles, CA.
- Liew, S.-L.** (2012, September). *Action observation and motor-related networks in chronic stroke patients.* Dr. Michelle Harris-Love, National Rehabilitation Hospital & Georgetown University, Washington D.C.
- Liew, S.-L.,** & Clewett, D. (2012, May). *Arterial spin labeling.* USC Neuroimaging Workshop, University of Southern California, Los Angeles, CA.
- Liew, S.-L.** (2012, March). *The mirror neuron system and clinical implications.* Guest lecturer, University of Southern California, Los Angeles, CA.
- Liew, S.-L.** (2012, February). *Cultural influences on social cognition.* Guest lecturer, University of Southern California, Los Angeles, CA.
- Liew, S.-L.** (2011, November). *Experience-dependent modulations of action observation networks in healthy and clinical populations.* Dr. Leonardo Cohen, National Institute of Neurological Disorders and Stroke, NIH, Bethesda, MD.
- Liew, S.-L.** (2011, October). *Experience and the action observation network.* Social Cognitive Neuroscience Laboratory, Dr. Matthew Lieberman, UCLA, Los Angeles, CA.
- Liew, S.-L.** (2011, October). *Experience-dependent modulations of action observation networks in healthy and clinical populations.* Virginia Tech Carilion Research Institute, Roanoke, VA.
- Liew, S.-L.** (2011, September). *Who's the Boss: Cross-cultural differences in the workplace.* Invited speaker at Mindshare LA, general public audience of over 350. Los Angeles, CA.
- Liew, S.-L.** (2011, June, August). *Introduction to Neuroimaging Tools | fMRI Preprocessing Methods.* USC Neuroimaging Workshop(s), Los Angeles, CA.
- Liew, S.-L.** (2010, July). *Action understanding of physically different others and empathy correlations.*

Selected student speaker at the Riken BSI Summer Program, Tokyo, Japan.

**Liew, S.-L.** (2010, April). *The EAPSI experience*. Invited chair of the alumni panel at the National Science Foundation's East Asia & Pacific Summer Institutes. Washington, DC.

**Liew, S.-L.** & Aziz-Zadeh, L. (2010, March). *The neuroscience of daily social interactions*. Invited speaker at the USC Occupational Science 22<sup>nd</sup> Annual Symposium, Los Angeles, CA.

**Liew, S.-L.** & Aziz-Zadeh, L. (2009, October). Playing with words: The active role of language in everyday occupations. Invited presentation at the Society for the Study of Occupations: USA Annual Meeting, New Haven, CT.

**Liew, S.-L.** (2009, April). *EAPSI China*. Invited alumni speaker at the National Science Foundation's East Asia & Pacific Summer Institutes, Washington, DC.

## SELECTED CONFERENCE PROCEEDINGS

Ito, K., Kim, H., & **Liew, S.-L.\*\*** (2017, Nov) A comparison of automated lesion segmentation approaches for stroke MRI data. *American Society of Neurorehabilitation*, Baltimore, MD.

Zavaliangos-Petropulu, A., Jahanshad, N., Ching, C.R.K., Isaev, D., Ragothaman, A., Gutman, B., Kim, B., Robertson, A.D., Rondina, J.M., Aziz-Zadeh, L., Byblow, W.D., Cramer, S.C., Domin, M., Kautz, S.A., Kuceyeski, A., Lang, C.E., Liu, J., Lotze, M., MacIntosh, B.J., Ramos-Murguialday, A., Roberts, P., Stinear, C.M., Thielman, G., Wang, J., Winstein, C., Wittenberg, G., Yu, C., Thompson, P.M., & **Liew, S.-L.\*\*** (2017, Nov) Subcortical brain shape differences relate to post-stroke motor behavior. *American Society of Neurorehabilitation*, Baltimore, MD.

Anglin, J.M., Banks, N.W., Sondag, M., Ito, K.L., Kim, H., Chan, J., Ito, J., Jung, C., Lefebvre, S., Nakamura, W., Saldana, D., Schmiesing, A., Tran, C., Vo, D., Ard, T., Heydari, P., Kim, B., Aziz-Zadeh, L., Cramer, S.C., Liu, J., Soekadar, S., Nordvik, J.-E., Westlye, L.T., Wang, J., Winstein, C.J., Yu, C., Ai, L., Koo, B., Craddock, R.C., Milham, M., Lakich, M., Pienta, A., Stroud, A., & **Liew, S.-L.\*\*** (2017, Nov). The Anatomical Tracings of Lesions After Stroke (ATLAS) Dataset – Release 1.1. *Society for Neuroscience*, Washington D.C.

Ito, K., Garrison, K., Heydari, P., Sobhani, M., Werner, J., Damasio, H., Winstein, C., & Aziz-Zadeh, L., & **Liew, S.-L.\*\*** (2017, June). Functional interhemispheric connectivity is decreased after stroke during action observation. *Organization for Human Brain Mapping*, Vancouver, Canada.

Ito, K., Garrison, K., Heydari, P., Sobhani, M., Werner, J., Damasio, H., Winstein, C., & Aziz-Zadeh, L., & **Liew, S.-L.\*\*** (2017, June). Interhemispheric connectivity is decreased during action observation after stroke. *OT Summit of Scholars*, Boston, MA. Awarded Best Student Poster.

Wathugala, M., Saldana, D., Anglin, J., Chan, J., & **Liew, S.-L.\*\***. (2017, April) Mindfulness meditation effects on spasticity and quality of life in stroke survivors. *Medical Students Research Forum*. Selected for an Oral Presentation.

Spicer, R., Anglin, J., Krum, D., & **Liew, S.-L.\*\*** (2017, March). REINVENT: A low-cost, virtual reality brain-computer interface for severe stroke upper limb motor recovery. *IEEE Virtual Reality Conference*. Los Angeles, CA.

Anglin, J., Saldana, D., Schmiessing, A., & **Liew, S.-L.\*\*** (2017, March). Transfer of a skilled motor learning task between virtual and conventional training environments. *IEEE Virtual Reality Conference*. Los Angeles, CA.

**Liew, S.-L.**, Jahanshad, N., Anglin, J., Khoshab, N., Kim, B., Nakamura, W., Nhoung, H., Rondina, J., Tran, C., Borich, Mc., Boyd, L., Byblow, W., Dimyan, M., Ermer, E., Lang, C., Li, J., Nichols, T., Roberts, P., Sanossian, N., Soekadar S., Stinear, C., Ward, N., Westlye, L. T., Winstein, C., Wittenberg, G. F., Cramer, S. C., & Thompson, P. M. (2016, Nov). ENIGMA Stroke Recovery: Big data neuroimaging to predict motor recovery. *Society for Neuroscience*, San Diego, CA.

Anglin, J.M., Sugiyama, T., & **Liew, S.-L.** (2016, Nov.). Visuomotor adaptation in head-mounted virtual reality versus conventional training. *Society for Neuroscience*, San Diego, CA. Selected for Hot Topics.

**Liew, S.-L.**, Jahanshad, N., Anglin, J., Khoshab, N., Kim, B., Nakamura, W., Nhoung, H., Rondina, J., Tran, C., Borich, Mc., Boyd, L., Dimyan, M., Ermer, E., Lang, C., Li, J., Nichols, T., Roberts, P., Sanossian, N., Soekadar S., Ward, N., Westlye, L. T., Winstein, C., Wittenberg, G. F., Cramer, S. C., & Thompson, P. M. (2016, June). ENIGMA Stroke Recovery: Big data neuroimaging to predict motor recovery. *Organization for Human Brain Mapping Annual Meeting*, Geneva, Switzerland.



- Ito, K., **Liew, S.-L.**, Garrison, K., Heydari, P., Sobhani, M., Werner, J., Damasio, H., Winstein, C., & Aziz-Zadeh, L. (2016, June). Laterality in the action observation network after stroke. *Organization for Human Brain Mapping*, Geneva, Switzerland.
- Heydari, P., **Liew, S.-L.**, Damasio, H., Winstein, C., & Aziz-Zadeh, L. (2016, June). Activity patterns in motor regions of chronic stroke patients for action observation, execution and imitation. *Organization for Human Brain Mapping*, Geneva, Switzerland.
- Liew, S.-L.**, Jahanshad, N., Anglin, J., Khoshab, N., Kim, B., Nakamura, W., Nhoung, H., Rondina, J., Tran, C., Borich, Mc., Boyd, L., Dimyan, M., Ermer, E., Lang, C., Li, J., Nichols, T., Roberts, P., Sanossian, N., Soekadar S., Ward, N., Westlye, L. T., Winstein, C., Wittenberg, G. F., Cramer, S. C., & Thompson, P. M. (2016, May). ENIGMA Stroke Recovery: Big data neuroimaging to predict motor recovery. *NCMRR Moving Rehabilitation Forward Meeting*, Bethesda, MD.
- Liew, S.-L.**, Thompson, T., Ramirez, J.J., Butcher, P., Taylor, J.A., & Celnik, P.A. (2015, October). Difficulty of visual transformation modulates the contributions of explicit and implicit learning with and without tDCS. *Society for Neuroscience*, Chicago, IL.
- Dayan, E., Lopez-Alonso, V., **Liew, S.-L.**, & Cohen, L.G. (2015, October). Distributed anatomical substrates identified by pattern classification predict cortical excitability and inhibition. *Society for Neuroscience*, Chicago, IL.
- Dayan, E., **Liew, S.-L.**, & Cohen, L.G. (2015, June). Modular organization of reward networks in the human brain. *Organization for Human Brain Mapping*, Honolulu, HI.
- Liew, S.-L.**, Rana, M., Cornelsen, S., Furtunato de Barros Filho, M., Birbaumer, N., Sitaram, R., Cohen, L., & Soekadar, S. (2015, February). Improving cortico-subcortical communication after stroke. *Real-time functional imaging and neurofeedback*, Gainesville, FL.
- Liew, S.-L.**, Ramirez, J.J., Butcher, P., Cohen, L., Taylor, J.A., & Celnik, P.A. (2014, November). Anodal tDCS of prefrontal cortex and cerebellum enhance different aspects of motor learning in a visuomotor adaptation task. *Society for Neuroscience*, Washington, D.C.
- Liew, S.-L.**, Gonzalez-Castillo, J., Horovitz, S., Roopchansingh, V., Tinaz, S., Hallett, M., & Cohen, L.G. (2013, November). Using neurofeedback from real-time fMRI connectivity patterns to enhance skilled motor performance. [Abstract]. *Society for Neuroscience*, San Diego, CA. Selected for Neuroscience 2013 Hot Topics.
- Liew, S.-L.**, Garrison, K., Winstein, C., Cohen, L. & Aziz-Zadeh, L. (2013, June). Functional connectivity of the action observation network after stroke. [Abstract]. *Organization of Human Brain Mapping*, Seattle, WA.
- Liew, S.-L.**, Sheng, T., & Aziz-Zadeh, L. (2012, June). Observing actions performed by a congenital amputee activates one's own sensorimotor regions. [Abstract]. *Organization of Human Brain Mapping*, Beijing, China.
- Liew, S.-L.**, Garrison, K.A., Haldar, J., Winstein, C.J., Damasio, H., & Aziz-Zadeh, L. (2012, April). The mirror neuron system: Implications for occupational therapy and stroke rehabilitation. [Abstract]. *American Occupational Therapy Association Annual Meeting*, Indianapolis, IN.
- Liew, S.-L.**, Garrison, K.A., Haldar, J., Roh, A., Winstein, C.J., Damasio, H., & Aziz-Zadeh, L. (2012, February). Structural neuroanatomy of lesioned brains in chronic stroke patients and correlations with functional activation of motor-related neural networks. [Abstract]. *USC School of Dentistry Research Day*, Los Angeles, CA. Awarded First Place in division.
- Liew, S.-L.**, Garrison, K.A., Haldar, J., Winstein, C.J., Damasio, H., & Aziz-Zadeh, L. (2011, November). Structural neuroanatomy of lesioned brains in chronic stroke patients and correlations with functional activation of motor-related neural networks. [Abstract]. *Society for Neuroscience Annual Meeting*. Washington, D.C.
- Liew, S.-L.**, Garrison, K.A., Damasio, H., & Aziz-Zadeh, L. (2011, August). Experience and action observation networks in the brain: Integrating findings across physical differences and physical disability. [Abstract]. *FENS-IBRO Imaging Training Center*, Lausanne/Geneva, Switzerland.
- Liew, S.-L.**, Seckin, M., & Aziz-Zadeh, L. (2011, April). The effects of experience on the observation of novel effectors and empathy correlations. [Abstract]. *Cognitive Neuroscience Society Annual Meeting*, San Francisco, CA.
- Liew, S.-L.**, Seckin, M., Johnson, A. & Aziz-Zadeh, L. (2011, February). The role of experience in understanding physically different others. [Abstract]. *USC School of Dentistry Research Day*, Los Angeles, CA. Awarded First Place in division.

- Liew, S.-L.**, Seckin, M., & Aziz-Zadeh, L. (2011, January). Action observation of a physically different individual: An fMRI study of visual experience. [Abstract]. *Experiment Psychology Society*, London, UK.
- Liew, S.-L.**, Dandekar, F., Epstein, D., & Aziz-Zadeh, L. (2010, November). The neural correlates of visual creativity. [Abstract]. *Society for Neuroscience Annual Meeting*. San Diego, CA.
- Liew, S.-L.**, Sheng, T., & Aziz-Zadeh, L. (2010, April). The neural correlates of stigma for physical differences. [Abstract]. *Cognitive Neuroscience Society Annual Meeting*, Montreal, Canada.
- Liew, S.-L.**, Sheng, T., & Aziz-Zadeh, L. (2010, February). The neural correlates of observing physical differences and empathy correlations. [Abstract]. *USC School of Dentistry Research Day*, Los Angeles, CA. Awarded Second Place in division.
- Liew, S.-L.**, Han, S., & Aziz-Zadeh, L. (2009, October). Activation of mirror neuron and theory of mind systems is modulated by familiarity and individual differences in empathy. [Abstract]. *Society for Neuroscience Annual Meeting*, Chicago, IL.
- Liew, S.-L.**, Aziz-Zadeh, L., & Han, S. (2009, April). Out of hand: How experience and race modulate neural correlates of gesture observation. [Abstract]. *Cognitive Neuroscience Society Annual Meeting*, San Francisco, CA.
- Liew, S.-L.**, Sheng, T., & Aziz-Zadeh, L. (2009, February). Mission impossible: An fMRI study of motor empathy for impossible actions in a woman with congenital limb deficiencies. [Abstract]. *USC School of Dentistry Research Day*, Los Angeles, CA. Awarded Second Place in division.
- Aziz-Zadeh, L., Sheng, T., **Liew, S.-L.**, Bukowski, H., Damasio, H., & Damasio, A. (2009, April). Understanding and empathizing with dissimilar others: A case study of a congenital amputee. [Abstract]. *Cognitive Neuroscience Society Annual Meeting*, San Francisco, CA.

## TEACHING & MENTORING EXPERIENCE

### COMMITTEE CHAIR

- 2017-** **PhD Committee Chair**, Student: Octavio Marin-Pardo, PI: Sook-Lei Liew, PhD, OTR/L, Program: Biomedical Engineering
- 2016-** **PhD Committee Co-Chair**, Student: Artemis Zavaliangos-Petropulu, PI: Paul Thompson, PhD, Program: Neuroscience Graduate Program
- 2016-** **PhD Committee Chair**, Student: Kaori Ito, PI: Sook-Lei Liew, PhD, OTR/L, Program: Occupational Science, concentration in Neuroscience

### COMMITTEE MEMBER

- 2017-** **PhD Committee Member**, Student: Akira Nagamori, PI: Francisco Valero-Cuevas, PhD, Program: Biomedical Engineering
- 2016-** **PhD Committee Member**, Student: Rini Varghese, PI: Carolee Winstein, PhD, FAPTA Program: Biokinesiology
- 2016-** **PhD Committee Member**, Student: Alaa Albishi, PI: Beth Fisher, PhD, PT, Program: Biokinesiology
- 2015-** **PhD Committee Member**, Student: Sonja Fenske, PI: Jason Kutch, PhD, Program: Neuroscience Graduate Program
- 2015-** **PhD Committee Member**, Student: Emily Kilroy, PI: Lisa Aziz-Zadeh, PhD, Program: Occupational Science, concentration in Neuroscience

### OTHER GRADUATE MENTORSHIP

- Kira Luzzo*, Doctor of Physical Therapy, 2017-
- David Saldana*, Master of Arts, Occupational Therapy, 2017-
- Faisal Rashid*, Master of Science, Neuroimaging and Informatics, 2017-
- Julia Anglin*, Master of Science, Computer Science, 2016-
- Melanie Wathugalu*, Keck School of Medicine, 2016-
- Allie Schmiessing* Master of Arts, Occupational Therapy, 2016-

Jennifer Chan, Master of Arts, Occupational Therapy, 2016-  
 Harrison Ma, Doctor of Physical Therapy, 2016-  
 Cristi Magracia, Doctor of Physical Therapy, 2015-2017  
 Nicholas Banks, Master of Science, Stem Cell Biology, 2016-2017  
 Catherine Tran, Master of Science, Neuroimaging and Informatics, 2015-2016  
 Kaori Ito, Master of Arts, Occupational Therapy, 2015-2016  
 William Nakamura, Master of Arts, Occupational Therapy, 2015-2016

## TEACHING

- 2016** **Instructor**, OT 515: Neuroscience of Behavior, *University of Southern California*  
 A 4-unit course on the neuroscience of behavior and cognition
- 2008-2012, 2015-** **Guest Lecturer**, *University of Southern California*  
 Provided guest lectures for both masters-level physical rehabilitation/neuroscience, neuroimaging and undergraduate neuroscience courses.
- 2013** **Scientists Teaching Science Course Certificate of Training**, *NIH*  
 Completed an intensive 9-week NIH-sponsored online course on teaching philosophies and methods for educating students in scientific principles.
- 2012** **Instructor**, OT 441: Foundations - Neuroscience, *University of Southern California*  
 Taught foundations of neuroscience & clinical implications for undergraduates.
- 2007** **Graduate Student Instructor**, *University of Southern California*  
 Led labs for summer courses in neuroscience & kinesiology for masters students.
- 2008-2012** **Graduate Student Mentor**, *University of Southern California*  
 Mentored over 15 undergraduates from varying academic disciplines on cognitive neuroscience research including structural MRI and fMRI techniques and data analysis, with over 8 receiving university undergraduate research fellowships.

## SERVICE

- 2017-2018** **Editor**, *Special Issue: Collaborative Efforts for Understanding the Human Brain, Frontiers in Neuroinformatics*
- 2017-2018** **Faculty Advisory Committee**, USC Stevens Center for Innovation
- 2017-2019** **Faculty Advisor**, Distinguished Speaker Committee, Neuroscience Graduate Program
- 2016-** **Executive Committee**, Center for Image Acquisition (CIA), USC Stevens Neuroimaging and Informatics Institute
- 2016-2017** **Editor**, *Journal of Motor Behavior*
- 2016** **Instructor**, *Noninvasive Brain Stimulation Methods Course*
- 2015-2016** **Executive Editor**, *Special Issue: Neural Enhancement for Independent Living, Journal of Motor Behavior*
- 2014, 2015, 2016** **Chair**, Brainhack Los Angeles (November 2016), Brainhack Los Angeles, part of Brainhack Americas (2015), and Brainhack DC, part of Brainhack EDT (2014), a network of sites across North, Central and South America dedicated to open source neuroimaging and neuroscience; organized local talks, Brainhack activities
- 2011-present** **Ad Hoc Reviewer**, *Cerebral Cortex, Biological Psychiatry, NeuroImage, Human Brain Mapping, Brain Imaging and Behavior, Journal of Cognitive Neuroscience, Frontiers in Neuroscience, Frontiers in Human Neuroscience, Frontiers in Cellular Neuroscience, Social Cognitive & Affective Neuroscience, Journal of Occupational Science, Journal of Motor Behavior, Archives of Physical Medicine &*

*Rehabilitation, Journal of Neurophysiology, Journal of Neural Engineering, Neuromodulation: Technology at the Neural Interface*

- 2012-2016** **Immediate Past Chair (2015-2016), Chair (2014), Vice Chair (2013), Social Coordinator (2012-2013),** *Organization of Human Brain Mapping Student & Postdoc Executive Group*
- 2008,2009,2011** **Chairperson of Judging Committee,** *Los Angeles County Science & Engineering Fair*  
**2007, 2011** **Science Fair Mentor,** *USC Health Sciences Campus Science Fair*  
Mentored a classroom of 5<sup>th</sup> graders in an underprivileged elementary school on the scientific method, and led them through the steps of creating and presenting a class science fair project.
- 2011** **NeurOnline Champion,** *Society for Neuroscience NeurOnline Communities*  
*Responsible for seeding, monitoring, and contributing to the growth of the Society for Neuroscience's online communities.*
- 2007-2016** **Rice Alumni Regional Coordinator & Young Alumni Ambassador,** *Association of Rice University Alumni*  
Initiate, plan, and execute Rice alumni events, build the alumni community in Los Angeles and DC; build the young alumni network for DC and LA, and represent Rice at college fairs and prospective student interviews.

## CLINICAL EXPERIENCE

- 2010-2012** **Occupational Therapist (OTR/L),** *Supplemental Health Care*  
Level I Per Diem Occupational Therapist specializing in adult neurology and physical disabilities, geriatrics, and skilled nursing, with an emphasis on providing care as part of an interdisciplinary team.
- 2012** **Enhancing Motor Control for Occupation course,** *Rancho Los Amigos, Downey, CA*  
Sixteen week clinical course on principles and methods for remediation of motor control problems following upper motor neuron lesions. Included weekly lecture and fieldwork experiences with acute/subacute stroke patients. Covered spasticity management, peripheral nerve stimulation, Neurodevelopmental Treatment (NDT) and Neuro-Integrative Functional Rehabilitation and Habilitation (NEURO-IFRAH).
- 2009** **Level II Fieldwork Intern,** *Cedars Sinai Medical Center, Beverly Hills, CA*  
Twelve week full-time internship in acute rehabilitation with a focus on patients with spinal/neurological conditions. Development of evaluation skills, treatment planning and execution, and assessment.
- 2007-2008** **Level II Fieldwork Intern,** *Therapy West and pLAy Studio, Inc., Los Angeles, CA*  
Twenty-four week part-time internship focused on treatment of pediatrics with disabilities, with an emphasis on skill development in areas of sensory integration, fine motor, gross motor, postural control, sensory motor, personal-social, perceptual, attentional, and self-help components.

## PROFESSIONAL AFFILIATIONS & CERTIFICATIONS

### Registered Occupational Therapist

National Board for Certification in Occupational Therapy (NBCOT)

### Licensed Occupational Therapist

California Board of Occupational Therapy (CBOT)

**Certified Strength and Conditioning Specialist**

National Strength and Conditioning Association (NSCA)

**Healthcare Provider CPR/AED Certified**

American Heart Association (AHA)

**Member**, IEEE

**Member**, Society for Neuroscience (SFN)

**Member**, Organization for Human Brain Mapping (OHBM)

**Member**, American Occupational Therapy Association (AOTA)

**Member**, American Society for Neurorehabilitation (ASNR)

**Member**, The NeuroBureau