

SONG-JOO LEE

EDUCATION

Doctor of Biomedical Engineering, August 2007- Present

Northwestern University, Evanston, IL.

Dissertation Advisor: Julius P. A. Dewald, PT, PhD.

Committee members: Ana Maria Acosta, PhD, Mitra Hartmann, PhD, Matthew Tresch, PhD, Jun Yao, PhD

Master of Biomedical Engineering, August 2005-January 2007

The Catholic University of America, Washington, DC

Thesis: Biomechanics of overground and treadmill walking in healthy individuals

Thesis Advisor: Joseph M. Hidler, PhD.

Thesis Reviewer: Peter S. Lum, PhD.

Bachelor of Biomedical Engineering, August 2001-May 2005

The Catholic University of America, Washington, DC

Seoul Science High School* / Korean GED (High School Entrance and Graduating Certificate Test for Self-study students)

*admits gifted students in science, South Korea.

PUBLICATIONS

Lee, S. and J.M. Hidler. "Advancing Our Understanding of Walking on a Treadmill: Implications in Neurorehabilitation," *Motion Times* 2(2006): 2-3.

Lee, S. and J.M. Hidler. "Biomechanics of Overground versus Treadmill Walking in Healthy Individuals," *Journal of Applied Physiology* 104 (2008): 747-755.

CONFERENCE PRESENTATION/ ABSTRACT PROCEED

Blonien, N., **Lee, S.** and J.M. Hidler. "Comparisons of Joint Kinematics, Joint Kinetics, and EMG Patterns for Treadmill versus Over-ground Gait." APTA-CSM Conference, Boston. Feb. 2007.

Lee, S. and J.M. Hidler, "Quantification of Joint moment errors associated with inaccurate center of pressures." Northern East American Society of Biomechanics, College Park, March. 2007.

Lee, S. and J.M. Hidler, "Quantification of Joint moment errors associated with inaccurate center of pressures." The Twenty Third Southern Biomedical Engineering Conference, Washington DC, April. 2007.

Lee S, Yao J, Acosta AM, J.P.A. Dewald. "The effects of asymmetric tonic neck reflex during reaching movements following stroke: preliminary results." 31st Annual international conference of the IEEE engineering in medicine and biology society, Minneapolis, Sep, 2009.

Lee S, Yao J, Acosta AM, J.P.A. Dewald. "Reaching distance can be influenced by the asymmetric tonic neck reflex in chronic hemiparetic stroke survivors." Society of Neuroscience, Chicago, Oct 2009.

RESEARCH EXPERIENCE

Research Assistant, NINC, Department of Physical Therapy and Human Movement Sciences, Feinberg School of Medicine, Chicago IL, Jan '08-present

Conduct research toward to PhD degree

- Conduct experiments on stroke population (EEG, EMG, kinematic) and process data using Brain Vision Analyzer, Curry 6.0 and Matlab
- Operate ACT3D and modify software in visual C++ for my protocol – Haptic Master Force/Position Control robot
- Check JR^{3D} force sensor to validate the force matrix value
- Build a circuitry for a vibrator incorporated with labview and knowledge of electrical stimulators

Research Assistant, CABRR, National Rehabilitation Hospital, Washington DC, May '05- June '07

- Conducted research on biomechanics of overground and treadmill walking as a part of master's thesis
 - Designed an experiment protocol, wrote IRB and set-up/conducted the experiment
 - Built a skeletal model and performed inverse dynamics via Visual 3D software
 - Analyzed data in Matlab and published a paper (19 healthy subjects were analyzed)
- Aided physical therapists, engineers, residents, and a faculty advisor in current research studies occurring in the Center for Applied Biomechanics and Rehabilitation Research at the NRH
 - Assisted a clinical study with residents for gait analysis part: the effect of Botox reducing pain on the plantar-fascia
 - Assisted to calibrate force sensors in the ADAL treadmill.
 - Operated codamotion camera and visual 3D software

Research Assistant, College of Nursing at the Catholic University of Korea, Seoul, Korea, June '04-August '04

- Assisted faculty members in research of “Do-Not-Resuscitate order forms and their applications in the States and South Korea” in order to create a DNR order form for Saint Mary Hospital in Korea for the first time.
- Translated chapters of medical ethics book from English to Korean
*Research mentor: Sung-suk Han, SOLPH, RN., PhD, Jin-Sun Yong, SOLPH, RN., PhD.

Undergraduate Research Assistant, Home Care Technology Center at CUA, Washington DC, March '03 -August '03

- Assisted graduate students with data collection and analysis
- Aided faculty members to collect in MRI simulation with XFDTD software, Collected data of MRI simulation at the FDA Center for Devices & Radiological Health (CDRH) in summer of 2003
-Summer project: Find the resonance effect during MRI simulation at different frequency related with different head sizes and with inhomogeneous cell tissue types
* Research mentor: Uyen Nguyen, PhD, Issac Chang, PhD, Binh Tran, PhD.

Project Based Courses

*Advanced Mechatronics (team effort of two): Built a temperature sensing device maintaining a constant pressure and position by using a thermistor, peltier, strain gauges, and a motor for a person with targeted reinnervation surgery.

Course instructor: Michael Peshkin, PhD.

*Senior year research project (team effort of three): Instrumented a band sensor glove to decipher American Sign Language for basic vowels.

Course instructor: Otto Wilson, PhD.

*Senior year design project (team effort of three): Instrumented a pressure and temperature sensor to detect pressure sore.

Course instructor: Joseph Hidler, PhD.

*Biomedical Instrument project (team effort of two): Instrumented EEG filter sensors to detect alpha wave.

Course instructor: Chris Kirtley, MD, PhD.

TEACHING EXPERIENCE

Teaching Assistant Northwestern University, Department of Biomedical Engineering, Evanston, IL, April-Jun '09
Biomechanics of Movements: a senior and graduate level course teaching muscle and joint mechanics, imaging techniques such as microscopy, ultrasonography, and motion analysis, inverse Dynamics/Lagrangian Dynamics
Responsibilities -Lab setup, homework grading, office hour

Young Adult Tutoring Volunteer, Holy Name Cathedral, Chicago, IL, Nov '08-Jan '09

Help middle school students to prepare math section for the high school entrance exam in Chicago

Private Korean Tutor, Private American Family, Greenbelt, MD, October '02-March '04

Taught Korean in reading and writing at the elementary and middle school level

HONOR

- NU Biomedical Engineering Research Assistantship, 2008- present
- NU Biomedical Engineering Fellowship 2007-2008
- Bio-Med Research School-RIRC Scholarships, 2005-2006
- CUA School of Engineering Scholarships, 2005-2006
- Magna Cum Laude
- H.T. Atabek award 2005, Excellence in Biomedical Engineering, CUA
- Dean's List 2001-2005 (all academic years), Quinns Family scholarship, 2004-2005
- Tau Beta Pi 2003, Engineering Honor Society
- H.P. Ward award 2003, Excellence in Organic Chemistry, CUA
- F.O. RICE award 2002, Excellence in General Chemistry, CUA
- PHI ETA SIGMA2002, National Honor Society

CERTIFICATE

- Basic People Skills Module of the Tau Beta Pi Engineering Futures Program , 2004

SOCIETIES

Tau Beta Pi, lifetime

Korean American Scientists and Engineers Association, 2007-present

Student member of Society of Neuroscience, 2009-present

Student member of IEEE and EMBS, 2009-present

SKILLS

- Computer: Matlab , Visual 3D, Codamotion, CURRY, Brain Vision Analyzer, modifiable knowledge of Visual C++, Labview, XFDTD.
- Instrumentation: Calibrating force sensors, knowledge of building simple circuits such as temperature sensors using thermistor and pressure sensors using either strain gauges or flexi force sensors, building a motor amplifier/ filters
- Language: Fluent Korean

OTHER EXPERIENCE/ COMMUNITY SERVICE

Staff, Korean Student Association, Northwestern University, September '09-present

Webmaster, Korean American Student Association, CUA, August '04-May '05

Vice President, Korean American Student Association, CUA, August '03- May '04

Corresponding Secretary, Tau Beta Pi, CUA, August '03-May '04

Nursing Unit Volunteer, Doctor's Community Hospital, Lanham, MD, August '03- February '04

Registration Assistant, The Second International Cardiovascular Conference, The First International Implant Conference, Bethesda, MD, July '03

Volunteer, American Red Cross, Jan '02

HOBBIES

Cooking, Traveling, and Walking.