Yi-Tsen Pan

Contact Information

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Research Interests

Sensory augmentation, medical robotics, wearable haptics, rehabilitation engineering, human balance and gait analysis

Education

Texas A&M University, College Station, Texas USA

Ph.D., Mechanical Engineering, August, 2013 - Present

- Advisor: Pilwon Hur (HUman Rehabilitation group)

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

MS., Mechanical Engineering, August, 2011 - May, 2013

- Advisor: Cameron Riviere (Surgical Mechatronics Lab)

National Taiwan University, Taipei, Taiwan

BS., Bio-Industrial Mechatronics Engineering, September, 2007 - June, 2011

- Dissertation : "Realize hardness measurement on the prototype of instrument for minimally invasive surgery"
- Advisor: Yen-Wen Lu

Professional Experience

Department of Mechanical Engineering, Texas A&M University

Research assistant **December, 2014 - Present**

- Design and develop a portable sensory augmentation system that can induce skin stretch feedback in response to signal postural sway to enhance balance for elderly and people with neurologically impairments

Department of Mechanical Engineering, Carnegie Mellon University

Research assistant **January, 2012 - January, 2013**

- Develop a 3-D path-following needle steering system using duty-cycled rotation for minimally invasive navigation in brain surgery
- Implement extended kalman filter for 3-D tracking and state estimation using Matlab.

Academic Experience

Texas A&M University

Teaching Assistant **Spring 2016**

Duties included the grading of assignments, and having office hours. Courses taught,

- MEEN 655 Design of Nonlinear Control Systems

Peer-reviewed journal papers

1. **Pan, Y.T.**, Yoon, H.U., and Hur. P. (2016). A Portable Sensory Augmentation Device for Balance Rehabilitation Using Fingertip Skin Stretch Feedback, *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. DOI:10.1109/TNSRE.2016.2542064

Papers in preparation

Pan, Y.T., and Hur, P. Effectiveness of Skin Stretch Feedback for a Balance Rehabilitation System: Is Velocity Information of Postural Sway More Simply Perceived By the User?, *Journal of NeuroEngineering and Rehabilitation*

Conference Publication

1. **Pan, Y.T.**, and Hur. P. (2016). Velocity-based Sensory Augmentation via Fingertip Skin Stretch on Quiet Standing, *American Society of Biomechanics 2016*, 2-5 August, Raleigh, NC, Untied States. (Thematic poster)

2. Yoon, H.U., Lytle, L., **Pan, Y.T.**, Kumar, N.A., Hong, W., McGowan, D., and Hur. P. (2016). Identifying a Perceptual Mapping from Bidirectional Skin Stretch Patterns to Motor Space Perceptions: A Preliminary Study, *American Society of Biomechanics 2016*, 2-5 August, Raleigh, NC, Untied States. (Submitted)

3. **Pan, Y.T.**, Kim, Y.S., and Hur. P. (2015). Design of Sensory Augmentation System for Postural Control Rehabilitation, *American Society of Biomechanics 2015*, 5-8 August, Columbus, OH, Untied States. (Poster)

4. **Pan, Y.T.**, Kim, Y.S., and Hur. P. (2015). Effect of Sensory Augmentation via Skin Stretch Feedback on Quiet Standing Balance, *American Society of Biomechanics 2015*, 5-8 August, Columbus, OH, Untied States. (Podium)

5. Chang Y.S., **Pan, Y.T.**, and Lu, Y.W. (2010). A Prototype System with Tactile Feedback and Haptic Display for the Minimally Invasive Surgery, *BIOME Paper Presentation*, 18 November, Pingtung, Taiwan.

Non-refereed Posters

1. **Pan, Y.T.**, Yoon, H.U., and Hur. P. (2016). A Portable Sensory Augmentation Device for Balance Rehabilitation Using Fingertip Skin Stretch Feedback, *Texas Systems Day 2016*, 8 April, Austin, TX, Untied States.

2. **Pan, Y.T** and Hur. P. (2015). Effect of sensory augmentation via skin stretch feedback on quiet standing balance, *Texas A&M University ENG-LIFE 2015 Workshop*, 24 April, College Station, TX, Untied States.

3. Lehocky, C.A., **Pan, Y.T.**, Wood, N.A., and Riviere, C.N. (2012). Three dimensional needle steering with duty-cycled rotation, *IEEE ICRA Needle-Steering Workshop*, 14-18 May, St. Paul, MN, Untied States.

Honors and Awards

1. **Association of Chinese American Professionals (ACAP) Student Research Project Contest Finalist**, June 2015
2. **Texas A&M University Graduate Student Travel Award**, Summer 2015 ($1000)

Acquired Skills

- Programming Languages: C/ C++, Python, Java, Matlab/ Simulink, Mathematica and LabVIEW
- Microcontroller: Arduino, NI myRIO, Intel 8051, and Atmel AVR
- Mechanical Design: Solidworks, Autodesk Inventor, Autodesk 3D Studio Max, and AutoCAD
- Physical engine: Unity3d, Open Dynamics Engine, and Webots
- Statistical Packages: IBM SPSS
- Professional: Real-time data acquisition, signal processing, electromyography, human balance quantification, 3D printing, and robot kinematics/ dynamics/ control

Volunteer Experience

- BJWL Children's Programs, Family Resources, Pittsburgh, PA, USA. May-August, 2012.
  Homework help, inspire a love of reading and math for K-12 students.
- Kind Kids Club Camp, National Taiwan University, Taipei, Taiwan September, 2010- July, 2011.
  Empower the elementary students living in remote areas. Bring joy and knowledge to their lives.
- Project Cambodia, ELIV, Taipei, Taiwan. July, 2010.
  10-day international volunteering in Cambodia to help/ educate people living in disadvantaged areas in farming, health promotion, disease prevention, and goods transportation.

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