Eren Alay

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EDUCATION

New Jersey Institute of Technology, *Newark, NJ*
M.S., Biomedical Engineering — January 2014
Thesis: Using piezoelectric backscatter signal for remote sensing of neural signals
Advisor: Mesut Sahin

Ankara University, *Ankara, Turkey*
B.S., Electronics Engineering — June 2011
Thesis: Oral, nasal, and abdominal respiratory tracking and monitoring system
Advisor: Osman Erogul

ACADEMIC EXPERIENCE

Research Associate — December 2014 - Present
Center for Injury Biomechanics, Materials and Medicine
New Jersey Institute of Technology, Newark, NJ

- Performed research on the characteristics and the effects of blast waves on both animal and biomechanical models.
- Provided technical, analytical and numerical support for overall $4.5 million Department of Defense and U.S. Army sponsored blast-induced neurotrauma (BINT) research and development projects.

Research Assistant — June 2014 - October 2014
NYU Langone Health, Bellevue Hospital Center
New York, NY

- Contributed to traumatic brain injury study analyzing eye movement data and optimizing the software compatibility of eye movement detection devices.

Research Assistant — January 2012 - January 2014
Neural Prosthetics Laboratory
New Jersey Institute of Technology, Newark, NJ

- Conducted research on energy harvesting issues on wireless stimulation of spinal cord injury.

PROFESSIONAL EXPERIENCE

Summer Intern — July 2010 - September 2010
ASELSAN Military Electronic Industries, Inc.
Test Engineering Division, Ankara, Turkey

- Contributed to development of a computer-based military test platform using MS Visual C# to test the recorded signals gathered from fieldwork. This work resulted not only in the creation of a military test platform but also saved the company $100k for related software test platforms.

PUBLICATIONS

Peer-reviewed journal articles

J1. **E Alay**, M Skotak, A Misistia, N Chandra (2018). Dynamic loads on human and animal surrogates at different test locations in compressed-gas-driven shock tubes. Shock Waves 28 (1), 51-62.

J2. KV Rama Rao, S Iring, D Younger, M Kuriakose, M Skotak, **E Alay**, RK Gupta, N Chandra (2018). A single primary blast-induced traumatic brain injury in rodent model causes cell-type dependent increase in NADPH oxidase isoforms in vulnerable brain regions. Journal of Neurotrauma.

J3. M Skotak*, **E Alay***, N Chandra (2018). On the accurate determination of shock wave time-pressure profile in the experimental models of blast induced neurotrauma. Frontiers in neurology 9, 52.

J4. A Sundaramurthy, M Skotak, **E Alay**, G Unnikrishnan, H Mao, X Duan, ST Williams, TH Harding, N Chandra, J Reifman (2018). Assessment of the effectiveness of combat eyewear protection against blast overpressure. Journal of biomechanical engineering 140 (7), 071003.

J5. M Skotak*, **E Alay***, JQ Zheng, V Halls, N Chandra (2018). Effective testing of personal protective equipment in blast loading conditions in shock tube: Comparison of three different testing locations. PloS one 13 (6), e0198968.

Conference abstracts/posters

C1. K Ruiz, D Patel, **E Alay**, M Skotak, N Chandra (2018). Cavitation in Heterogeneous Environments. 50th Biomedical Engineering Society Annual Meeting, Atlanta, GA.

C2. JJ Rodriguez, **E Alay**, M Skotak, J Zheng, V Halls, N Chandra (2018). The effect of specimen location and cross-sectional area on the distribution of surface pressure under shock wave loading conditions. Military Health Science Research Symposium, Kissimmee, FL.

C3. MT Townsend, **E Alay**, M Skotak, N Chandra (2018). Combined Computational and Experimental Methods to Understand Traumatic Brain Injury Mechanisms in Primary Blast Loading Conditions. Military Health Science Research Symposium, Kissimmee, FL.

C4. R Rattazzi, D Patel, **E Alay**, M Skotak, J Zheng, V Halls, N Chandra (2018). The Performance Evaluation of Combat Helmets Under Blast Loading in the Shock Tube. Military Health System Research Symposium, Kissimmee, FL.

C5. S Chandrasekaran, **E Alay**, M Skotak, N Chandra (2017). Air Bubble Dispersion and Coalescence Under Shock Loading Conditions: A Model for Cavitation. MHSRS-17-1443, Military Health Science Research Symposium, Kissimmee, FL.

C6. A Cardenas, A Misistia, **E Alay**, M Skotak, N Chandra, GH Kamimori (2017). Detection of a Pressure Breakpoint Inside the Advanced Combat Helmet During Blast Exposure. MHSRS-17-0567, Military Health Science Research Symposium, Kissimmee, FL

C7. A Misistia, A Cardenas, **E Alay**, M Skotak, N Chandra, GH Kamimori (2017). Averaging overpressure from multiple sensors can misrepresent the reality of blast exposure. MHSRS-17-0567, Military Health Science Research Symposium, Kissimmee, FL.

C8. M Skotak, **E Alay**, JQ Zheng, V Halls, N Chandra (2017). Towards the standardization of PPE testing methodology under blast loading in the shock tube: the effect of headform location on the pressure characteristics. MHSRS-17-1444, Military Health Science Research Symposium, Kissimmee, FL.

C9. A Sundaramurthy, G Unnikrishnan, H Mao, X Duan, ST Williams, TH Harding, M Skotak, **E Alay**, N Chandra, and J Reifman (2017). Are spectacles and goggles effective against blast overpressure? MHSRS-17-0310, Military Health Science Research Symposium, Kissimmee, FL.

C10. A Sundaramurthy, G Unnikrishnan, H Mao, X Duan, ST Williams, TH Harding, M Skotak, **E Alay**, N Chandra, J Reifman (2017). Are spectacles and goggles effective against blast overpressure? The 2nd Japan-US Technical Information Exchange Forum on Blast Injury, Tokyo, Japan.

C11. S Chandrasekaran, **E Alay**, M Skotak, N Chandra (2017). Air Bubble Dispersion and Coalescence Under Shock Loading Conditions: A Model for Cavitation, Northeast Bioengineering Conference(NEBEC), Newark, NJ.

C12. S Kahali, M Kuriakose, M Skotak, **E Alay**, A Misistia, N Chandra (2016). Artifact-free loading conditions in compressed gas driven shock tube with end plate: Focus in primary blast injury animal models. Journal of Neurotrauma 33 (13), A93-A93.

C13. **E Alay**, M Skotak, A Misistia, N Chandra (2016). Protection effectiveness against blast overpressure: Role of shield-specimen geometric mismatch and gap-filler material properties. Journal of Neurotrauma 33 (13), A93-A93.

C14. A Mishra, D Ozgulbas, **E Alay**, EH Kim, T Alvarez (2013). Checking the saliency of the stimuli on central versus peripheral visual field. 39th Annual Northeast Bioengineering Conference.

C15. **E Alay***, B Altinoz*, D Ozgulbas*, Z Telatar, O Erogul (2011). Oral, nasal, and abdominal respiratory tracking and monitoring system. TIPTEKNO 2011, 16th Annual Biomedical Engineering National Conference, 419-422.

*indicates equal authorship

RELEVANT COURSEWORK

- Statistics and R - HarvardX: PH525.1x (online - Harvard University),
- CS109 - Data Science (online - Harvard University),
- Hands-On Machine Learning with Scikit-Learn and TensorFlow (online - OReilly Media),
- Introduction to Accelerated Computing (online - NVIDIA QWIKLABS),
- Applications of Deep Learning with Caffe, Theano and Torch (online - NVIDIA QWIKLABS),
- Introduction to Biostatistics,
- Neural Engineering,
- Neural fMRI,
- Cell and Molecular Tissue Engineering,
- Probability and Random Variables,
- Linear Algebra,
- Digital Signal Processing.

TECHNICAL SKILLS

- Programming Languages: Python, R, C, MS Visual C#.
- Other tools/softwares: LaTeX, OriginLab, Minitab, MATLAB, G*Power, ImageJ, SPM, MS Office Applications, Adobe Creative Cloud Applications.