Omar B. Osman

Ph. D. Candidate

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Education

2021 Ph. D. Biomedical Engineering
State University of New York, Stony Brook

2019 M.S. Biomedical Engineering
State University of New York, Stony Brook

2015 B.S. Bioengineering
University of California, Riverside

Experience

2016 – Pres. **Research Assistant** ***THz Biophotonics Lab | Stony Brook, NY***
Experimentally and theoretically developed methods and signal processing techniques for THz spectroscopy in biomedical applications and standoff chemical detection.

2016 **Research Assistant** ***SynED Lab | Stony Brook, NY***

Studied synthetic gene circuits in yeast to understand dose dependent and non-genetic heterogeneity during a laboratory rotation.

2016 **Research Engineer** ***Wainamics Inc | Fremont, CA***

Designed and tested point-of-care microfluidic diagnostic platforms with a small team (product development consultancy) for clients in large corporations, government and startups.

2013-2015 **Undergraduate Researcher** ***Aqueous Bioprocess Lab | Riverside, CA***

Conducted experiments and analysis for pretrement of cellulosic biomass (waste feedstock) to enhance hydrolysis and fermentation for ethanol and fuel precursors.

Projects

2018-2021 ***In-vivo* THz imaging of burns injuries** **Stony Brook, NY**
With a small team, we completed the first series of *in vivo* porcine burn studies using THz imaging for quantitative burn diagnostics.

2017-2019 **THz spectroscopy of corneal phantoms** **Stony Brook, NY**
Built the groundwork for the team that currently studies THz spectral imaging in ophthalmology by modeling the electromagnetic and diffusion dynamics in a corneal phantom.

2017-2018 **Signal processing for chemical detection** **Stony Brook, NY**
Developed, alone and in collaboration, signal processing algorithms for detection of spectral features from illicit chemicals that are obscured by electromagnetic scattering.

2018 **Commercialization plan for novel PET tracer** **Stony Brook, NY**
As a part of the FOBIP program, I led a small team to create a commercialization plan to bring a novel PET radiotracer research to market and pitch the plan to a group of local investors.

2014 **Senior Design Project** **Riverside, CA**
Designed a prototype and created a commercialization plan for an EMG controlled and actuator driven knee brace.

Awards

Sep 2019 **Outstanding Student Poster and Presentation Award**
"THz time-domain imaging for burn characterization in an acute in vivo porcine scald model"
Carnegie Mellon Forum on Biomedical Engineering | Pittsburgh, PA

Mar 2019 **Outstanding Student Poster and Presentation Award**
"Investigation of water diffusion dynamics in corneal phantoms using terahertz time-domain spectroscopy"
Optical THz Science and Technology Conference | Santa Fe, NM

Programs:

Fundamentals of the Bioscience Industry *Stony Brook, NY*

An in-depth interactive program that covered intellectual property, regulatory affairs, commercialization, venture capital, investment, financing, and corporate culture as they relate to the biosciences industry. The capstone project for the course was a full-length commercialization plan for technology that was developed in one of our university's research labs. The commercialization plan was ultimately presented to a group of local investors.

Siegman International School on Lasers *Rochester, NY*

A topical conference with workshops tailored for graduate students who work with laser development and applications. Talks focused on academic research, (ie accelerator physics, free electron lasers, disk lasers, attosecond physics, terahertz, and fiber design), industrial research (ie quantum cryptography, optical design, and remote sensing), career planning, and entrepreneurship.

Presentations

October 2019. *Terahertz Time-Domain Imaging of Spherical Resolution Targets and Corneal Phantoms*. Society for Biomedical Engineers Annual Meeting. Philadelphia, PA. Oral Presentation.

September 2019. *Terahertz Pulsed Imaging for burn depth determination in an in vivo porcine scald model.* Carnegie Mellon Forum on Biomedical Engineering. Pittsburgh, PA. Poster Presentation. Outstanding Student Poster Award

August 2019. *A THz-TDS study of dehydration dynamics of corneal phantoms.* Siegman International School on Lasers. Rochester NY. Poster Presentation.

March 2019. *A THz-TDS study of dehydration dynamics of corneal phantoms.* Optical Terahertz Science and Technology. Santa Fe, NM. Poster Presentation. Outstanding Student Poster Award

Publications

* denotes equal contribution
Full publication list available on Google Scholar

Adam Singer, MD, Juin Zhou, BS, Omar Osman, MS, Zachery B Harris, BS, Mahmoud E Khani, BS, Evyatar Baer, Nigel Zhang, BS, Steve McClain, MD, M Hassan Arbab, PhD. Comparison of Contact and Scald Burns in a Porcine Model, Journal of Burn Care & Research, Volume 41, Issue Supplement_1. Page S79. (2020).

M Hassan Arbab, PhD, Omar Osman, MS, Juin Zhou, BS, Mahmoud E Khani, BS, Zachery B Harris, BS, Adam Singer, M. Terahertz Spectral Imaging for Burn Depth Determination in an in Vivo Porcine Scald Model, Journal of Burn Care & Research, Volume 41, Issue Supplement_1, Pages S80–S8. (2020).

*Andrew Chen, *Omar B. Osman, Zachery B. Harris, Azin Abazri, Robert Honkanen, and M. Hassan Arbab. "Investigation of water diffusion dynamics in corneal phantoms using terahertz time-domain spectroscopy," Biomed. Opt. Express 11, 1284-1297. (2020).

Osman OB, Arbab MH. Mitigating the effects of granular scattering using cepstrum analysis in terahertz time-domain spectral imaging. PLoS ONE 14(5): e0216952. (2019).

O. B. Osman, A. Virk and M. H. Arbab. "Application of Cepstrum Filtering in THz Images through Scattering Media," 2018 43rd International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz), Nagoya, pp. 1-2. (2018).

Thanh Yen Nguyen, Charles M Cai, Omar Osman, Rajeev Kumar, and Charles E Wyman. CELF pretreatment of corn stover boosts ethanol titers and yields from high solids SSF with low enzyme loadings. Green Chemistry. 18(6). (2016).