Alex E. Bocchieri

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bocchs.github.io

RESARCH INTERESTS: Computational imaging, computer vision, machine learning

EDUCATION

University of Wisconsin – Madison **Madison, WI**
College & Science
Ph.D. in Computer Sciences Fall 2020 – Present

- **Cumulative GPA**: 3.86 / 4.00

Johns Hopkins University **Baltimore, MD**
Whiting School of Engineering
Master of Science in Computer Science Spring 2020
Master of Science in Electrical and Computer Engineering Spring 2019
Bachelor of Science in Electrical Engineering Spring 2018

- **Master's Thesis:** Deep Learning Techniques for Image Segmentation of Whole Body MRI
- **Cumulative GPA (graduate)**: 3.79 / 4.00
- **Cumulative GPA (undergraduate)**: 3.67 / 4.00, Departmental Honors, Dean's List 6 Semesters

HONORS

- **IEEE-Eta Kappa Nu Honor Society** Inducted Spring 2017
- **Delta Phi Alpha German Honor Society** Inducted Spring 2018

WORK EXPERIENCE

University of Wisconsin – Madison **Madison, WI**
Graduate Researcher: Gamma Ray Imaging with SPAD Camera January 2021 – Present

- Investigating a novel method of measuring gamma ray interactions in a scintillator with a lens and a single-photon camera
- Developed Geant4 code (C++) to simulate gamma rays interacting in a scintillator volume
- Simulated image formation on SPAD sensor using ray optics
- Setup hardware experiments and collected experimental data
- Paper in preparation

Lawrence Berkeley National Lab **Berkeley, CA**
Intern: Radar SLAM and Scene Data Fusion June – August 2022

- Developed ROS code for a handheld device with multiple radar chips, lidar sensor, IMU, and radiation detector
- Collected radar and lidar point cloud measurements, performed SLAM using Google Cartographer
- Obtained initial results of radar SLAM with radiation sources fused onto the radar point cloud

University of Wisconsin – Madison **Madison, WI**
Teaching Assistant: CS252 – Intro to Computer Engineering August 2020 – May 2021

- Duties included: hold office hours, answer questions on Piazza, grade homework and exams

Johns Hopkins University **Baltimore, MD**
Graduate Researcher: Deep Learning applied to Medical Images January 2019 – July 2020

- Medical image segmentation of muscular dystrophy in whole body MRI (3D) using deep learning
- Segmentation methods developed were used by doctors in their clinical research
- Deep reinforcement learning: locating anatomical landmarks within whole body MRI (2D and 3D, single-agent and multi-agent)

ADDITIONAL EXPERIENCES

- Poster presentations
  - ICCP 2023
  - NNSA UPR 2021, 2022, 2023
  - MIDL 2020
- Oral presentations
  - ETI Workshop 2022, 2023 (NNSA)
- Reviewer for Medical Physics journal (reviewed deep learning papers)
- Intern at JHU Applied Physics Laboratory - Summer 2018, 2019

SKILLS

Programming Languages: Python, Matlab, C/C++
Software: PyTorch, Geant4, ROS, Google Cartographer
Spoken Languages: Native English, Fluent Italian, Basic German

PUBLICATIONS

- Haoran Wang[*], Weitang Liu, **Alex Bocchieri**, Yixuan Li[*]. "Can multi-label classification networks know what they don't know?" *Neural Information Processing Systems (NeurIPS),* 2021.
  [*]Contributed equally.

- Doris G. Leung, **Alex E. Bocchieri**, Shivani Ahlawat, Michael A. Jacobs, Vishwa S. Parekh, Vladimir Braverman, Katherine Summerton, Jennifer Mansour, Nikia Stinson, Genila Bibat, Carl Morris, Shannon Marraffino, Kathryn R. Wagner. "A phase Ib/IIa, open-label, multiple ascending-dose trial of domagrozumab in fukutin-related protein limb-girdle muscular dystrophy." *Muscle & Nerve*. 2021; 64(2): 172–179.

- Vishwa S. Parekh[*]**, Alex E. Bocchieri**[*], Vladimir Braverman, Michael A. Jacobs. "Multitask radiological modality invariant landmark localization using deep reinforcement learning." *Proceedings of the Third Conference on Medical Imaging with Deep Learning (MIDL 2020), PMLR*. 121:588-600, 2020.
  [*]Contributed equally.

- Doris G Leung, **Alex E Bocchieri**, Shivani Ahlawat, Michael A Jacobs, Vishwa S Parekh, Vladimir Braverman, Katherine Summerton, Jennifer Mansour, Genila Bibat, Carl Morris, Shannon Marraffino, Kathryn R Wagner. "Longitudinal functional and imaging outcome measures in FKRP limb-girdle muscular dystrophy." *BMC Neurology*. 20, 196 (2020).

- Vishwa S. Parekh, John Laterra, Chetan Bettegowda, **Alex E. Bocchieri**, Jay J. Pillai, Michael A. Jacobs. "Multiparametric Deep Learning and Radiomics for Tumor Grading and Treatment Response Assessment of Brain Cancer: Preliminary Results." *arXiv e-prints*, art. arXiv:1906.04049, Jun 2019.

- **Alex E. Bocchieri**, Vishwa S. Parekh, Kathryn R. Wagner. Shivani Ahlawat, Vladimir Braverman, Doris G. Leung, Michael A. Jacobs. "Multiparametric Deep Learning Tissue Signatures for Muscular Dystrophy: Preliminary Results." *Medical Imaging with Deep Learning* (MIDL). 2019 Conference Proceedings, Abstract Paper.