

**Professional Summary**

Experienced research scientist currently serving as technical lead for several programs with the research and development branch at the Ledios Inc. Innovation Center. Primary recent technical focus on research and development of novel AI/ML automated target recognition (ATR) algorithms exploiting 1-D and 2-D RF (SAR and HRR) and EO/IR imagery. Responsible for technical road-mapping, proposal writing, and interfacing with customers as well as technical leadership directing the day-to-day tasks of cross-functional teams of software engineers and researchers. Over ten years of experience working in research and development environments in both academic and professional settings. Six years of prior experience working in biomedical optical imaging research and development, both hardware and software, which included experience conducting and managing neurological and musculoskeletal data collections from both humans and animal models utilizing multiple near-infrared spectroscopy (NIRS) technologies. Practice in all phases of the research and development lifecycle, working both alone and in teams, and interacting with customers and leading community stakeholders to inform solution development and innovation

**Right to Work**

Citizenship: United States

Security Clearance: Active DoD Top Secret/SCI

**Work Experience***Research Scientist and Technical Lead, Leidos Inc. – Beavercreek, Ohio***June 2022 – Present**

Worked in various roles including principal investigator, technical lead and research scientist supporting the Electronic Warfare branch of the Leidos Innovation Center in Beavercreek, Ohio. Unclassified work experience detailed below:

**Database Optimization and Sustainment (DOS) Program (June 2022 – Present)**

- The DOS program aims to develop and validate a database of CAD models and Xpatch generated synthetic RF signatures for vehicles of interest to the AFRL Combat Identification program element within AFRL-RYZ. Personally responsible for validating synthetic signatures against measured sources and developing synthetic data augmentation algorithms to close synthetic to measured gap.
- Developed process for synthetic signature verification through benchmark performance testing using gold-standard, fielded CID algorithms.

- Develop novel AI/ML CID algorithms, heavily focused on Convolutional Neural Network (CNN) approaches.
- Responsible for preparing and delivering technical progress briefings as lead contributor to customers, funding stakeholders and technical community at interdisciplinary meetings/working groups. Liaised customer feedback directly into product development team.

#### Multi-static High Range Resolution CID (MSHRR) Program (August 2022 – Present)

- The MSHRR program focuses on developing novel AI/ML ATR algorithms for ground target identification exploiting High Range Resolution (HRR) signatures. Personally responsible for developing signal processing, image formation and initial 1D-CNN ATR implementation pipeline in MATLAB during 6-month seedling phase of the program, leading to 2+ years of ongoing work totaling \$2M+
- Led junior engineers in maturing initial MATLAB software pipeline into a pyTorch-based AI/ML workflow with an MLflow backend for hyperparameter tuning, which involved mentoring them on both CONOPs and EM-theory knowledge necessary to implement the appropriate signal processing, signature formation and CNN training/inferencing algorithms
- Responsible for preparing briefing material for novel AI/ML ATR application, cultivating buy-in from customer and key government stakeholders which secured funding for a multi-year ongoing effort.

#### Internal Research and Development (IRAD) program (FY2024)

- Served as Principal Investigator for Leidos-LiNC Horizon2025 (IRAD) program leading small technical team investigating novel classifier performance prediction modeling when transitioning from high to low resolution operating condition environments.

*Research Engineer, Wright State University Biomedical Imaging Lab – Dayton, Ohio*

#### **August 2017 - June 2022**

- Design and refine EO/IR imaging systems in both free-space and fiber-optic regimes. Experience utilizing commercial NIRs systems (NIRx-NIRSport and ISS-Optiplex) and developed customer optical image applications through applying phenomenology of Near-Infrared Spectroscopy, Spatial Frequency Domain Imaging and Diffuse Correlation Spectroscopy to:
- Develop and apply signal and imaging processing algorithms to produce functional optical biomedical imagery using MATLAB. Leveraged machine learning (Naive Bayes, k-NN, SVM, Decision Trees) and deep learning (CNNs) concepts on multimodal optical imaging datasets to, 1) Establish novel biomarkers for neurodegenerative diseases (Huntington's, Autism Spectrum Disorder) and 2) Perform classification of cancerous tissue in multimodal (Optical/EEG) datasets using MATLAB.

- Project leader and project manager experience. Leading small scale (1-5 member) engineering teams.
- Writing proposals for National Institute of Health (NIH) funding channels: R01, R21, SBIR, STTR
- Write and maintain compliance on regulatory protocols for animal and human research. Responsible for writing and maintaining: 6 animal use protocols and 2 human research protocols through the Wright State University IACUC/IRB

*Research Assistant, Wright State University Ergonomics in Remote Environments Lab – Dayton, Ohio*

#### **May 2014 – August 2017**

- Designed and evaluated prototype fiber-optic shape tracking medical devices for endovascular surgery applications.
- Project leader and project manager experience. Leading small scale (1-5 member) engineering teams.
- Developed signal processing, pattern recognition and classification algorithms using MATLAB Signal and Imaging Processing and Machine Learning toolboxes.
- Technical Entrepreneurial Lead in NSF iCorp@Ohio participating in summer long intensive development program for receiving hands-on training to Ohio faculty and students in the Lean Launchpad methodology.

#### **Education**

##### **Wright State University - Dayton, Ohio**

B.S, M.S, PhD, Biomedical Engineering (2014, 2016, 2021)

Dissertation: “Noninvasive Blood Flow and Oxygenation Measurements in Diseased Tissue” [http://rave.ohiolink.edu/etdc/view?acc\\_num=wright1639414818597832](http://rave.ohiolink.edu/etdc/view?acc_num=wright1639414818597832)

Focus Area: Signal and Image processing, AI/ML, EO/IR Imaging, Medical Imaging

#### **Teaching Experience**

##### **Wright State University - Dayton, Ohio**

*Lecturer – Medical Imaging, code BME-4703*

Responsible for leading supplementary lectures and discussions for cross-listed 4<sup>th</sup> year B.S. and 1<sup>st</sup> year M.S course covering medical physics and image formation processes utilized in Magnetic Resonance Imaging (MRI), Computed Tomography (CT), X-ray, Ultrasound and Near-Infrared Spectroscopy (NIRs)

#### **Publications**

7 publications (3 first author) in leading biomedical optics journals of SPIE, Journal of Biophotonics and Biomedical Optics Express. Full listing available via LinkedIn, or on request via email.