

# CURRICULUM VITAE

**Name:** Bryar Shareef

**Email:** [bryar.shareef@unlv.edu](mailto:bryar.shareef@unlv.edu)

**Phone:** (208) 709-9685

## **RESEARCH INTERESTS and EXPERTISE**

Artificial intelligence (AI), machine learning (ML), image processing, computer vision, deep learning, and data analytics.

## **EDUCATION**

- Ph.D., Computer Science, University of Idaho August 2018 - August 2023
- M.S., Computer Science, Western Michigan University May 2013 - May 2015
- B.S., Computer Science, Salahaddin University-Erbil October 2005 - May 2009

## **RESEARCH & WORK EXPERIENCE**

- **Assistant Professor** at the Department of Computer Science, University of Nevada, Las Vegas  
**August 2023 –Present**
- **Graduate Research Assistant (GRA), Machine Intelligence and Data Analytics (MIDA) Lab**  
Department of Computer Science, University of Idaho **August 2018 –August 2023**

During my Ph.D. studies, my research mainly focused on developing new AI/ML approaches for accurate object segmentation and classification and applying them to the early detection of breast cancer using ultrasound images. Specifically, I ....

### **(1) Developed, implemented, and validated small-object-aware deep networks**

The newly proposed multi-encoder neural network architectures have filters with different shapes and extract and fuse image features at different scales. The new design does not need extensive pooling operations and can preserve fine details of images, which leads to the accurate detection of small objects.

### **(2) Developed a deep multi-task network for simultaneous object classification and segmentation**

The proposed multi-task neural network combines two separate tasks in one shared model. The network learns from both tasks and alleviates the low generalization issue caused by small training datasets. The learned shared features between object segmentation and classification improve the robustness and generalizability of the model.

### **(3) Benchmarked breast cancer detection using ultrasound images**

1) Built a large benchmark dataset with more than 3,000 breast ultrasound images. Designed a webpage to share the results, and source code, and prepared detailed documentation. 2) Proposed and implemented two novel deep neural networks for the segmentation of breast ultrasound images. The approaches achieved the lowest false positive rate for both small tumors and tumors of different sizes. 3) Designed a multitask learning approach for breast

tumor classification and segmentation. Successfully increased the detection accuracy by 8-12% compared to the current best models.

- **Other Research Experience**

- (1) Automatic Grading System for hand-writing math integral, Data Science Competition, the University of Idaho, ranked 4<sup>th</sup>, 2020**

- Developed a computer vision application to solve math equations (integrals) using Python and Keras libraries, and image processing techniques. Performed data pre-processing, feature engineering, augmentation, and visualization.

- (2) Cancer type classification using Genome, Data Science Competition, University of Idaho, Ranked 1<sup>st</sup>, 2022**

- Implemented three machine learning algorithms (XGBoost, SVM, and DT) for a genome bioinformatics dataset to find relationships between DNA and protein sequence alteration and cancer type using Python, Scikit-learn, Pandas, SQL, and Power BI. In addition, I created a dashboard and multiple animated visualizations to show the relationship between race, age, protein alteration, and cancer type.

- (3) Monte Carlo simulations, Parallel computation, Western Michigan University, 2015**

- Developed Monte Carlo simulations to compute Feynman loop integrals in high energy-physics, and integrals arising in stochastic geometry (12-dimension integrals and cube-tetrahedron) using Cuda, MPI, and OpenMP.

- **Data Analyst and IT specialist, Awamedica Ltd.**

**October 2015 – July 2018**

Performed data cleaning, analyzing, interpreting, and visualizing using different techniques. In addition, maintained computers and computer-based machines, servers, and networking. I accomplished the following:

- Performed data analysis to increase sales, and revenue and minimize waste.
- Visualization of complex data and analytical results using Power BI.
- Analyzed warehouse, and supply chain data to reduce raw materials and drug products becoming expired.
- Built employee attendance database management system.
- Configured and administered servers, switches, and routers, and provided employees support when needed.
- Maintained networking, VoIP, and computer-based chemical and biological lab machines.
- Installed and maintained security cameras, RAID, and their server.
- Supported more than 120 computers, network printers, managing attendance fingerprint machines, and security devices.

## **TEACHING EXPERIENCE**

- **Instructor, Erbil Polytechnic University**

**Aug 2015 - June 2018**

Worked as an Instructor and supervisor at the Information System Engineering Department. I taught the following courses:

- Data Structures (Java), 50-60 students per semester, 2015 Fall, 2016 Spring, 2016 Falls, 2017 Spring, 2017 Fall, and 2018 Spring.
- Digital Image Processing, 40-50 students per semester, 2015 Fall, 2016 Spring, 2016 Falls, 2017 Spring, 2017 Fall, and 2018 Spring.
- Computer Architecture, 50-60 students per semester, 2015 Fall, 2016 Spring, 2016 Falls, 2017 Spring, 2017 Fall, and 2018 Spring.
- **Lecturer, Bayan University**
  - Database Management System (SQL server), 20 students per semester, Aug 2016 - May 2017
  - Computer Graphics, 24 students per semester, Aug 2015 - May 2017
  - Computer Networks (Cisco Packet tracer), 16 students per semester, Aug 2015 - May 2016
- **Teaching Assistant, Salahaddin University-Erbil, September 2009 - April 2012**
  - Artificial Intelligence (Prolog, Python)
  - OOP (C++, Java)
  - Digital Image Processing using Matlab
  - Data Structures (C++, Java)
  - Web Design (HTML, JavaScript, CSS, PHP)
  - Computer Graphics using C++
  - Databases (MS. Access, PostgreSQL, SQL server)

## **SKILLS**

- **Image Processing, Computer Vision and Graphics**
- **Artificial Intelligence & Engineering:** Machine Learning, Deep Learning, Neural Network Design, Machine Vision, Digital Image Processing, Adversarial Machine Learning, Feature Engineering, Cloud Services, Quantitative Analysis, Probability & Statistics, Algorithm Design, Data Mining/Cleansing/Modeling, Database Management, Data Visualization & Dashboards, Hugging Face, NLP
- **Machine Learning in production and Data Visualization Tools:** Flask, Code/No-Code Azure ML, Deploy ML projects to web, Power BI, Tableau, Matplotlib, ggplot, Excel
- **Programming Language and Tools:** Python (Scikit-Learn, SciPy, Pandas), Tensorflow, Pytorch, R, Linux Shell, C++, Java, Matlab
- **Data processing | Databases Tools:** SQL, PostgreSQL, MS. SSAS, AWS SageMaker, PySpark, Apache Spark, Hadoop, DSOps, Hive, AWS, Kafka, MongoDB

## **Funding**

- **Graduate Fellowship funding.** Received \$3,000 to support my summer research at University of Idaho.

## **PROFESSIONAL SERVICES**

- **Journal Reviewer:** IEEE Transaction of Medical Imaging (2022), Artificial Intelligence in Medicine (2022), Cancers (2022), Biomedical Signal Processing and Control (2021), BMC (2022)
- **Conference Reviewer:** The IEEE International Symposium on Biomedical Imaging (ISBI) 2022

## **SEMINARS & PRESENTATIONS:**

- Lecture, Semantic segmentation at Deep Learning course, University of Idaho, December 2022
- Seminar, Benchmark for breast ultrasound image classification, at ML University of Idaho, May 2022
- Seminar, Enhanced small tumor-aware network (ESTAN) for breast ultrasound segmentation, at ML group, University of Idaho, October 2021
- Seminar, Small tumor-aware network (STAN) for breast ultrasound segmentation, at ML group, University of Idaho, April 2021
- Seminar, Medical Image segmentation, at Seminar course, University of Idaho, Spring 2021
- Bootcamp/Carpentry course for six hours, Linux operating system and Git & Github, Idaho National Laboratory, Summer 2021
- Workshop, Small tumor segmentation, Washington State University, January 2021
- Seminar, A benchmark for BUS segmentation, at ML group, University of Idaho, Feb 2020

## **PUBLICATIONS**

- **B. Shareef**, M. Xian, A. Vakanski, J. Ding, C. Ning, H.D. Cheng, "A benchmark for breast ultrasound image classification," *Ultrasound in Medicine & Biology*, 2023, under review.
- **Bryar Shareef**, Min Xian, Aleksandar Vakanski, Haotian Wang, Breast Ultrasound Tumor Classification using a Hybrid Multitask CNN-Transformer Network, 2023, in MICCAI 2023. Accepted.
- H. Wang, M. Xian, A. Vakanski, and **B. Shareef**, "SIAN: style-guided instance-adaptive normalization for multi-organ histopathology image synthesis," in IEEE International Symposium on Biomedical Imaging, 2023, pp. 1-5. Accepted.
- **B. Shareef**, A. Vakanski, P. E. Freer, and M. Xian, "Estan: Enhanced small tumor-aware network for breast ultrasound image segmentation," *Healthcare*, vol. 10, no. 11, pp. 2262, 2022.

- Y. Zhang, M. Xian, H.-D. Cheng, **B. Shareef**, J. Ding, F. Xu, K. Huang, B. Zhang, C. Ning, and Y. Wang, "BUSIS: A Benchmark for Breast Ultrasound Image Segmentation," *Healthcare*, vol. 10, no. 4, pp. 729, 2022-04-14, 2022.
- **B. Shareef**, M. Xian, and A. Vakanski, "STAN: Small tumor-aware network for breast ultrasound image segmentation," in IEEE International Symposium on Biomedical Imaging, Iowa City, Iowa, USA, 2020, pp. 1-5.
- R. E. Hiromoto, M. Haney, A. Vakanski, and **B. Shareef**, "Toward a Secure IoT Architecture," *Advanced Control Techniques in Complex Engineering Systems: Theory and Applications: Dedicated to Professor Vsevolod M. Kuntsevich*, pp. 297-323, 2019.
- **B. Shareef**, E. de Doncker and J. Kapenga, "Monte Carlo simulations on Intel Xeon Phi: Offload and native mode," 2015 IEEE High Performance Extreme Computing Conference (HPEC), Waltham, MA, USA, 2015, pp. 1-6, doi: 10.1109/HPEC.2015.7322456.