YONGCHENG MU

CS PH.D. CANDIDATE

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OBJECTIVE & SUMMARY

CS Ph.D. Candidate with deep research experience in Machine Learning, Computer Vision, and Large Multi-modal Models, specifically focusing on applications in Computational biology and Health Informatics. Seeking an internship opportunity for **Summer 2026** in an AI-focused team to expand my skills in ML/DL.

RESEARCH & TEACHING EXPERIENCE

- **Research Assistant** – *Old Dominion University, Norfolk, VA* *Oct. 2019 – Present*
  - **Project 1: Nutritional Analysis using Large Multi-modal Models (LMMs)**
    - Developed **DonateAndLearn**, an iPhone application that integrates LMMs for nutrition estimation from captured meal images; collected real-world food datasets (images, depth maps, sensor data) and health metrics to assist in diabetes research.
    - Benchmarked state-of-the-art LMMs on the collected phone dataset to evaluate zero-shot capabilities, comparing performance against baseline deep learning models (Nutrition5k) to assess practical applications. Improving LMMs' performance by incorporating physical information that predicted by an end-to-end trained model.
      (ResNet, Tensorflow, Keras, Python, LMMs, SwiftUI, Slurm, SAM2, Numpy, Pandas, PIL, OpenCV, image processing, Multi-task learning ...)
  - **Project 2: Deep Learning for Cryo-EM Map Segmentation**
    - Developed **DeepSSETracer** (ChimeraX-based plugin), a novel deep learning tool for segmenting secondary structures from 3D cryo-EM density maps, achieving significant accuracy improvements over baseline models.
    - Designed a U-Net framework in PyTorch with custom loss functions, significantly improving the segmentation performance of protein secondary structures.
      (UNet, PyTorch, CUDA, Slurm, Python, C++, cryo-EM maps, Protein Data Bank)
  - **Project 3: Technician & Research Assistant**
    - Designed and fabricated programmable electronic equipment for bio-electrics research experiments at the ODU Research Foundation (Dept. of Bio-electrics, Oct 2019 - Jan 2021).
- **Teaching Assistant** – *Old Dominion University, Norfolk, VA* *Jan. 2021 – Present*
  - Introduction to Theoretical Computer Science (CS390), Data Analytics Cybersecurity (CS469), Foundations of Computing (CS500), Algorithms and Data Structures (CS600)

CORE COMPETENCIES & TECHNICAL SKILLS

Languages:	Python, C++, LaTeX, HTML, Bash, Swift
Tools & Platforms:	Git, Unix, HPC Clusters, CUDA, Jupyter Notebook, VS Code, Google Colab, xCode
Neural Networks:	CNNs, RNN, Autoencoders, U-Nets, Transformers, GAN
Packages:	PyTorch, TensorFlow, Keras, Scikit-learn, Numpy, Scipy, Pandas, Matplotlib, PIL, OpenCV, SAM2, Mask-RCNN, ChimeraX

EDUCATION

- **Ph.D. in Computer Science** – *Old Dominion University, Norfolk, VA* *Expected Dec 2026*
  - Bioinformatics, Health Informatics, Deep Learning, Machine Learning, Large Multi-modal Models, Computer Vision
- **B.E. in Welding Technology and Engineering** – *Lanzhou University of Technology, China* *Sep 2009 – Aug 2013*

SELECTED PUBLICATIONS

- [ACM-BCB] **Yongcheng Mu**, et al. "Benchmarking and Improving Foundation Model Dietary Estimates from Meal Images". BCB '25: Proceedings of the 16th ACM International Conference on BCB, 2025.
- [Bioinformatics Advances] **Yongcheng Mu**, et al. "The combined focal loss and dice loss function improves the segmentation of beta-sheets in medium-resolution cryo-electron-microscopy density maps". Bioinformatics Advances, 2024.
- [Frontiers in Bioinformatics] **Yongcheng Mu**, et al. "A Tool for Segmentation of Secondary Structures in 3D Cryo-EM Density Map Components Using Deep Convolutional Neural Networks". Frontiers in Bioinformatics, 2021.