

DEBRA HOGUE, PhD

Computer Scientist · Human-AI Collaboration Researcher

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EDUCATION

Ph.D., Computer Science

University of Oklahoma · Gallogly College of Engineering · Norman, OK · 2026

Dissertation: “From Transparency to Agency: The MICA Framework for Addressing the Understanding-Trust Gap in AI-Assisted Camouflage Analysis.” Committee: Dr. Ghulam Jilani Quadri (Chair), Dr. Dean F. Hougen, Dr. Sridhar Radhakrishnan, Dr. Justin G. Metcalf. DoD SMART Scholar.

M.S., Computer Science

Oklahoma Christian University · 2017

B.S., Computer Science

University of Central Oklahoma · 2015

RESEARCH PROJECTS

MICA — Mixed-Initiative Camouflage Analysis Framework

University of Oklahoma · DIV-Lab · Oct 2024–Mar 2026 · Advisor: Dr. G.J. Quadri

Advanced MURDOC into a full mixed-initiative framework enabling bidirectional human-AI collaboration through ROI selection, adjustable sensitivity, and user feedback mechanisms, in response to findings that visual explanations alone improved understanding but did not build sufficient trust.

AI-Generated Camouflage Synthesis using Deep Learning

University of Oklahoma · Gallogly College of Engineering · Dec 2024–Mar 2026

Developed a specialized machine learning model using Low-Rank Adaptation (LoRA) fine-tuning to generate photorealistic camouflaged objects across biological and non-biological categories, addressing dataset scarcity in camouflage research.

MURDOC — Transforming Pixels into Perception

IEEE DASC 2024 · Feb 2023–Oct 2024

Interactive offline visualization tool integrating Informative AI (IAI) and eXplainable AI (XAI) techniques for camouflage detection, using a three-level decision hierarchy (ResNet50, EfficientDet-D7), Grad-CAM attention visualization, and the TOAST trust-measurement scale.

Video Motion Extraction for Temporal Analysis

University of Oklahoma · Gallogly College of Engineering · Jan 2024–Sep 2024

Explored temporal motion patterns in camouflaged wildlife using Porter-Duff blend modes and mixed-abstraction visual encoding; informed the IEEE VIS 2024 poster and related publication.

The Crisis Adoption Problem

Thought Leadership · Conference Pipeline · 2026

Original theoretical concept extending dissertation findings on time pressure and AI over-reliance into a structural critique of institutional AI adoption.

PUBLICATIONS

Building Operator Trust Through Mixed-Initiative Camouflage Analysis for Surveillance 2026 · Accepted, Publication Pending

Hogue, D., Elliott, D.S., & Quadri, G.J. · IEEE 45th Digital Avionics Systems Conference (DASC), Orlando, FL

Multi-Architecture Evaluation of Stable Diffusion with HSV–Gestalt Perceptual Loss

Under Review

Hogue, D., Elliott, D.S., & Quadri, G.J. · IEEE Computer Graphics and Applications

Agency Over Transparency: Evidence That Interactive Control, Not Explanation, Drives Trust in AI-Assisted Visual Detection

In Preparation

Hogue, D., Connelly, S., & Quadri, G.J. · Target: ACM CHI 2027

The Optimization-Perception Gap: Systematic Ablation of Perceptual Loss in Stable Diffusion

In Preparation

Hogue, D.L., & Quadri, G.J. · Target: IEEE Transactions on Image Processing

From Transparency to Agency: The MICA Framework for Addressing the Understanding-Trust Gap in AI-Assisted Camouflage Analysis

2026

Doctoral Dissertation · University of Oklahoma, Gallogly College of Engineering

Human-AI Trust Calibration in Mixed-Initiative Systems: A Framework for High-Stakes Environments

2025

AIAA/IEEE DASC 2025 · Montreal, Canada

MURDOC: Transforming Pixels into Perception for Camouflage Detection

2024 · Best in Session

IEEE 43rd Digital Avionics Systems Conference (DASC)

Using Informative AI to Understand Camouflaged Object Detection and Segmentation

2023 · Best in Session

IEEE/AIAA 42nd Digital Avionics Systems Conference (DASC)

CONFERENCE PRESENTATIONS & TALKS

Building Operator Trust Through Mixed-Initiative Camouflage Analysis for Surveillance

2026 · Accepted, Presentation Pending

IEEE 45th DASC · Orlando, FL

Human-AI Collaboration: Trust, Uncertainty, and the Design of Intelligent Systems

2025

InnoTech Oklahoma / OKWIT · Panel Speaker

MICA: Trust-Driven Design Refinements for Camouflaged Object Detection Applications

Dec 2025 · Best in Session

IEEE 44th Digital Avionics Systems Conference (DASC) · Montreal, Canada

MURDOC: Transforming Pixels into Perception for Camouflage Detection

Nov 2024 · Best in Session

IEEE 43rd DASC

Using Informative AI to Understand Camouflaged Object Detection and Segmentation

Nov 2023 · Best in Session

IEEE/AIAA 42nd DASC

Visual Analysis of Motion for Camouflaged Object Detection

Oct 2024 · Best Poster Honorable Mention

IEEE VIS 2024 · Poster

AWARDS & HONORS

- ◆ **44th AIAA/DASC Best in Session** — IEEE DASC · December 2025 · MICA Framework
- ◆ **43rd AIAA/DASC Best in Session** — IEEE DASC · November 2024 · MURDOC
- ◆ **42nd AIAA/DASC Best in Session** — IEEE DASC · November 2023 · Informative AI Paper
- ◆ **IEEE VIS Best Poster Honorable Mention** — IEEE VIS 2024 · Visual Analysis of Motion
- ◆ **SMART Retention Scholar** — DoD Science, Mathematics & Research for Transformation