Chase Walker

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Research Scientist - Explainable AI

Research Scientist in Explainable AI specializing in attribution methods and faithfulness metrics for vision, language, and multimodal transformers. Author of 7 peer-reviewed publications at AAAI, ICLR, IJCAI, and AISTATS, with state-of-the-art contributions to attribution methods and metrics, robustness, and out-of-distribution detection. My work emphasizes principled, quantitative evaluation and reproducible research, alongside mentoring and open research software development.

EDUCATION

PhD in Computer Engineering, University of Florida - Gainesville, FL *Anticipated August 2026*

Specialized in Explainable AI

Dean's Research Award; GPA 4.00

MS and BS in Computer Engineering, University of Central Florida - Orlando, FL *2018-2024*

Graduate Dean's Fellowship; Graduate Presentation Fellowship; GPA 3.95 and 3.83

RESEARCH EXPERIENCE

AI and Computing Lab, Graduate Research Assistant *2022 - Present*

Advisor: Dr. Rickard Ewetz — Research supported by grants from Lockheed Martin, U.S. DoE, and DARPA.

Conduct research in Explainable AI (XAI), developing attribution methods and evaluation metrics for deep neural networks with applications in adversarial robustness and out-of-distribution detection for high-stakes deployments.

- Developed Metric-Driven Attributions (MDA) framework outperforming 7 ViT attribution methods by 12% across 12 metrics on ImageNet, establishing state-of-the-art in transformer interpretability (**ICLR 2025**).
- Developed attribution graphs to enable an understanding of how causal information propagates from an LLM prompt to its generation, improving faithfulness on SOTA LLMs by 20% on average (Preprint 2025).
- Pioneered Magnitude Aligned Scoring (MAS) XAI evaluation benchmark 4x more sensitive to attribution changes, 2x more consistent, 1.6x more baseline-invariant than existing metrics (**IJCAI 2024**).
- Designed Integrated Decision Gradients (IDG), a novel path-based attribution to address gradient saturation in deep networks, achieving state-of-the-art performance (**AAAI 2024**).
- Created InFlow, an information flow-based explanation framework for ViTs outperforming 6 attribution methods by up to 18% in eight metrics (**AISTATS 2025**).
- Developed attribution-based adversarial detection system achieving 99% accuracy classifying pixel and patch attacks in CNNs trained on ImageNet; supported by DARPA (**MILCOM 2023**).
- Invited talk: "Towards Effective XAI of Modern Models" - Prince of Songkla University, Thailand (2024)
- Best Poster Award: 2025 Nelms IoT Conference.

MENTORSHIP AND SERVICE

- Mentored 12 undergraduate researchers; outcomes include 3 honors theses and 2 graduate admissions.
- Reviewed for ICLR, ICML, IJCAI, CVPR, ECCV, and JMLR.
- Volunteered for the 2024 and 2025 Nelms IoT Conferences.

INDUSTRY EXPERIENCE

Avanade/Accenture *Summer 2021*

Joint venture delivering enterprise-scale cloud and digital transformation solutions to Fortune 500 clients.

Back-End Developer Intern

- Contributed to 10-person development team building enterprise CRM system for field service management.

- Architected and deployed CI/CD pipeline using Azure DevOps, reducing deployment time and increasing release reliability for client-facing applications.
- Automated business workflows using Power Automate and Azure services, eliminating weekly manual processing and improving customer response time.

Limbitless Solutions

Nonprofit creating custom 3D-printed upper-limb prosthetics for children.

Associate Scholar — Full Stack Developer & EE Intern *Summer 2019 - 2021*

- Built internal project and people management tools as sole developer, streamlining workflow coordination for 30+ person engineering team.
- Designed custom HCI PCBs enabling gamified learning for prosthesis control.
- Conducted human-subjects studies validating user experience improvements for pediatric patients.

Assistant Scholar — Full Stack Developer Intern *Spring 2019*

- Built website from design mockups as sole developer (Bootstrap/HTML/CSS/JS), serving as primary platform for donor outreach and patient enrollment; 80% of code remains in production after 7+ years.

SELECTED PUBLICATIONS

7 peer-reviewed publications — 31 citations

1. **Chase Walker**, Sumit Jha, and Rickard Ewetz, "Metric-Driven Attributions for Vision Transformers", **ICLR 2025**.
2. **Chase Walker**, Md. Rubel Ahmed, Sumit Jha, and Rickard Ewetz, "Explaining ViTs Using Information Flow", **AISTATS 2025**.
3. **Chase Walker**, Kenny Chen, Sumit Jha, and Rickard Ewetz, "Integrated Decision Gradients: Compute Your Attributions Where the Model Makes Its Decision", **AAAI 2024**.
4. **Chase Walker**, Dominic Simon, Kenny Chen, and Rickard Ewetz, "Attribution Quality Metrics with Magnitude Alignment", **IJCAI 2024**.
5. **Chase Walker**, Dominic Simon, Sumit Jha, and Rickard Ewetz, "Adversarial Pixel and Patch Detection Using Attribution Analysis", **MILCOM 2023**.
6. **Chase Walker** and Rickard Ewetz, "Explaining the Reasoning of Large Language Models Using Attribution Graphs", Preprint, 2025.
7. Dominic Simon, **Chase Walker**, Will English, and Rickard Ewetz, "Question Decomposition using Masked Language Modeling for Knowledge Editing", Under Review, 2025.
8. Atandra Mahalder, **Chase Walker**, Sumit Jha, and Ricakrd Ewetz, "Are VLMs 3D-Aware? A Study of Scene Generation via Structured Tokenization", Under Review, 2025.
9. M Shifat Hossain, Sumit Jha, **Chase Walker**, and Rickard Ewetz, "Out-of-Distribution Detection for Contrastive Models using Angular Distance Measures", **ICMLA 2024**.

TECHNICAL SKILLS

- **ML/DL:** PyTorch, Captum, Transformers (LLM, VLM, VLA), CNNs, Hugging Face, HiPerGator (HPC)
- **Programming:** Python, Java, C, HTML/CSS/JS, ROS2
- **Deployment & Tools:** MLOps, DevOps, Git, Linux
- **Domain Expertise:** Computer vision, natural language processing, multi-modal decision making, interpretable AI, trustworthy AI, adversarial ML, robotics (control, dynamics, sensors, MuJoCo simulation)