Zander W. Blasingame

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Education

Clarkson University Jan 2025
Ph.D. in Electrical and Computer Engineering

- Adversarial ML, stochastic calculus, numerical methods, and differential equations in machine learning
- Advisor: Chen Liu

Clarkson University Jan 2025
M.Sc. in Electrical and Computer Engineering

Clarkson University 2018
B.Sc. in Computer Engineering

Publications

[1] **Zander W. Blasingame** and Chen Liu. "AdjointDEIS: Efficient Gradients for Diffusion Models". In: *The Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS)*. 2024. URL: https://openreview.net/forum?id=fAlcxvrOEX.

[2] **Zander W. Blasingame** and Chen Liu. "Fast-DiM: Towards Fast Diffusion Morphs". In: *IEEE Security & Privacy* 22.4 (2024), pp. 103–114. DOI: 10.1109/MSEC.2024.3410112.

[3] **Zander W. Blasingame** and Chen Liu. "Greedy-DiM: Greedy Algorithms for Unreasonably Effective Face Morphs". In: *2024 IEEE International Joint Conference on Biometrics (IJCB)*. 2024, pp. 1–11. DOI: 10.1109/IJCB62174.2024.10744517.

[4] **Zander W. Blasingame** and Chen Liu. "Leveraging Diffusion for Strong and High Quality Face Morphing Attacks". In: *IEEE Transactions on Biometrics, Behavior, and Identity Science* 6.1 (2024), pp. 118–131. DOI: 10.1109/TBIOM.2024.3349857.

[5] Richard E. Neddo, **Zander W. Blasingame**, and Chen Liu. "The Impact of Print-Scanning in Heterogeneous Morph Evaluation Scenarios". In: *2024 IEEE International Joint Conference on Biometrics (IJCB)*. 2024, pp. 1–10. DOI: 10.1109/IJCB62174.2024.10744441.

[6] Chutitep Woralert, Chen Liu, and **Zander Blasingame**. "Towards Effective Machine Learning Models for Ransomware Detection via Low-Level Hardware Information". In: *Proceedings of the 13th International Workshop on Hardware and Architectural Support for Security and Privacy*. HASP '24. Association for Computing Machinery, 2024, pp. 10–18. ISBN: 9798400712210. DOI: 10.1145/3696843.3696847. URL: https://doi.org/10.1145/3696843.3696847.

[7] Chutitep Woralert, Chen Liu, and **Zander Blasingame**. "HARD-Lite: A Lightweight Hardware Anomaly Realtime Detection Framework Targeting Ransomware". In: *IEEE Transactions on Circuits and Systems I: Regular Papers* 70.12 (2023), pp. 5036–5047. DOI: 10.1109/TCSI.2023.3299532.

[8] Chutitep Woralert, Chen Liu, **Zander Blasingame**, and Zhiliu Yang. "A Comparison of One-class and Two-class Models for Ransomware Detection via Low-level Hardware Information". In: *2023 Asian Hardware Oriented Security and Trust Symposium (AsianHOST)*. 2023, pp. 1–6. DOI: 10.1109/AsianHOST59942.2023.10409333.

[9] Chutitep Woralert, **Zander Blasingame**, and Chen Liu. "HARD-Lite: A Lightweight Hardware Anomaly Realtime Detection Framework Targeting Ransomware". In: *2022 Asian Hardware Oriented Security and Trust Symposium (AsianHOST)* (2022).

[10] **Zander Blasingame** and Chen Liu. "Leveraging Adversarial Learning for the Detection of Morphing Attacks". In: *2021 IEEE International Joint Conference on Biometrics (IJCB)* (2021), pp. 1–8. DOI: 10.1109/IJCB52358.2021.9484383.

[11] **Zander Blasingame**, Chen Liu, and Xin Yao. "Feature Creation Towards the Detection of Non-control-Flow Hijacking Attacks". In: *Artificial Neural Networks and Machine Learning – ICANN 2021*. Ed. by Igor Farkaš, Paolo Masulli, Sebastian Otte, and Stefan Wermter. Cham: Springer International Publishing, 2021, pp. 153–164. ISBN: 978-3-030-86362-3.

[12] Gildo Torres, Zhiliu Yang, **Zander Blasingame**, James Bruska, and Chen Liu. "Detecting Non-Control-Flow Hijacking Attacks Using Contextual Execution Information". In: *Proceedings of the 8th International Workshop on Hardware and Architectural Support for Security and Privacy*. HASP '19. Phoenix, AZ, USA: Association for Computing Machinery, 2019. ISBN: 9781450372268. DOI: 10.1145/3337167.3337168. URL: https://doi.org/10.1145/3337167.3337168.

[13] Chen Liu, Zhiliu Yang, **Zander Blasingame**, Gildo Torres, and James Bruska. "Detecting Data Exploits Using Low-Level Hardware Information: A Short Time Series Approach". In: *Proceedings of the First Workshop on Radical and Experiential Security*. RESEC '18. Incheon, Republic of Korea: Association for Computing Machinery, 2018, pp. 41–47. ISBN: 9781450357579. DOI: 10.1145/3203422.3203433. URL: https://doi.org/10.1145/3203422.3203433.

Experience

Graduate Research Assistant — 2018 - Present
Clarkson University — *Potsdam, NY*

- Studied the problem of guided generation with diffusion models
- Created bespoke ODE/SDE solvers for the continuous adjoint equations for diffusion models call Adjoint-DEIS
- Proposed a novel family of face morphing algorithms called **Di**ffusion **M**orphs (**DiM**)
- Developed a new face morph detection algorithm using adversarial learning

Undergradute Research Assistant — 2016 - 2018
Clarkson University — *Potsdam, NY*

- Developed machine learning algorithms for the detection of malware using low-level hardware information
- Studied the theory of semi-supervised anomaly detection problems

Engineering Intern — Summer 2016
Griffiss Institute - Air Force Research Laboratory — *Rome, NY*

- Generated meta-statistics for several machine learning datasets
- Designed android application to display data from a backend server

Engineering Intern — Summer 2014
InterOperability Laboratory - UNH — *Durham, NH*

- Designed a custom Linux image for embedded systems using the Yocto Project
- Created a web application capable of monitoring and maintaining server processes

Invited Talks

Transatlantic Dialogue on Presentation Attack Detection — Nov 2024
Diffusion Morphs (DiM): Diffusion is all you need for highly effective face morphs — *Washington, D.C.*

Journal Presentation - IEEE IJCB — Sep 2024
Diffusion Morphs (DiM): Leveraging Diffusion for Strong and High-Quality Face Morphing Attacks — *Buffalo, NY*

Idiap Research Institute — Jul 2024
Diffusion Morphs (DiM): The Power of Iterative Generative Models for Attacking FR Systems — *Martigny, Switzerland*

CITeR and DSA Webinar Feb 2024
Diffusion for the Generation of Face Morphs *Online*

International Face Performance Conference - NIST Nov 2022
Face Morph Generation and Attack Detection *Online*

International Face Performance Conference - NIST Oct 2020
Morph Attack Detection and Mitigation Projects *Online*

Projects

Efficient Gradients for Diffusion Models - AdjointDEIS *AdjointDEIS*

- Efficient algorithms for backpropagation in diffusion models for guided generation and related tasks
- Tools Used: Python, PyTorch

Diffusion Morphs (DiM) *Greedy-DiM*

- Developed a family of SOTA face morphing algorithms using diffusion models
- Tools Used: Python, PyTorch

Research Funding

Primary Student Investigator

Explainable Image Quality with Transformer-based Models 2023 - 2024

Funding from the Center for Identification Technology Research a NSF-IUCRC
Role: Helped draft grant proposal, primary student investigator
PIs: Chen Liu

Towards the Creation of a Large Dataset of High-Quality Face Morphs 2021 - 2024

Funding from the Center for Identification Technology Research a NSF-IUCRC
Role: Helped draft Clarkson's portion of grant proposal, primary student investigator at Clarkson University
PIs: Chen Liu, Stephanie Schuckers, Xin Li, Jeremy Dawson, Nasser Nasrabadi, David Doermann, Srirangaraj Setlur, Siwei Lyu, Xiaoming Liu, Sébastian Marcel

Comparative Detection of Facial Image Manipulation Techniques 2020 - 2022

Funding from the Center for Identification Technology Research a NSF-IUCRC
Role: Helped draft grant proposal, primary student investigator
PIs: Chen Liu

Adversarial Learning Based Approach Against Face Morphing Attacks 2019 - 2021

Funding from the Center for Identification Technology Research a NSF-IUCRC
Role: Helped draft grant proposal, primary student investigator
PIs: Chen Liu

Awards and Honors

IJCB Doctoral Consortium 2024

Clarkson Presidential Scholar 2015 - 2018

Best Oral Presentation for Software Engineering - Clarkson RAPS 2017

Teaching

Instructor 2020 - 2024
Griffiss Institute *Rome, NY*

- Taught and co-designed the introduction to CyberSecurity Summer Camp for advanced high school students

Graduate Teaching Assistant 2018 - 2021
Clarkson University *Potsdam, NY*

- Electrical Science (ES 250)

- Introduction to Digital Design (EE 264)
- Electrical and Computer Engineering Sophomore Lab (EE 211)

Undergraduate Teaching Assistant 2016 - 2018
Clarkson University *Potsdam, NY*

- Software System Architecture (EE 462)
- Differential Equations (MA 232)

Professional Services

Reviewer

International Conference on Artificial Intelligence and Statistics (AISTATS) 2025

Neural Information Processing Systems (NeurIPS) 2024

IEEE International Joint Conference on Biometrics (IJCB) 2024

IEEE International Conference on Pattern Recognition (ICPR) 2024

IEEE International Conference on Mobility: Operations, Services, and Technologies (MOST) 2023 - 2024

International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM) 2022 - 2023

International Conference on Artificial Neural Networks (ICANN) 2021

IEEE International Symposium on Workload Characterization 2020

IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS) 2019

IEEE International Symposium on Parallel and Distributed Processing with Applications 2018

Skills

Languages: Python, C/C++, Java, Javascript, Bash, MATLAB, VHDL

Frameworks: TensorFlow, Pytorch, Numpy, Scipy, Matplotlib, Plotly, Pandas, Jax

Tools: Vim, Git, Linux, Docker, LaTeX

Audio: Over a decade of exeperience as a FOH engineer including theater productions and worship services