Zachary Coalson

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Summary

I am a first-year PhD student at Oregon State University working on trustworthy and socially responsible AI under the supervision of Prof. Sanghyun Hong.

Education

Oregon State University, Corvallis, OR

Ph.D. in Computer Science — *Sept 2025 – June 2030 (expected)*
Advisor: Prof. Sanghyun Hong

Honors B.S. in Computer Science, Minor in Mathematics (*Summa Cum Laude*) — *Sept 2020 – June 2025*
Honors Thesis: *On the Robustness of NAS to Data Poisoning Attacks*
Undergraduate advisor: Prof. Sanghyun Hong

Honors and Awards

NSF GRFP, National Science Foundation — *2025*

GEM Fellowship, National GEM Consortium — *2025*

ARCS Foundation Oregon Scholar Award, Oregon State University — *2025*

Dean's List, Oregon State University — *2020 – 2025*

Finley Academic Excellence Scholarship, Oregon State University — *2020*

Publications

Conference Publications

[C.4] **Zachary Coalson**, Juhan Bae, Nicholas Carlini, Sanghyun Hong, "IF-Guide: Influence Function-Guided Detoxification of LLMs", *NeurIPS '25*, https://openreview.net/forum?id=V82wLePv0o.
[acceptance rate: 24.5%]

[C.3] Yu Sun, **Zachary Coalson**, Shiyang Chen, Hang Liu, Zhao Zhang, Sanghyun Hong, Bo Fang, Lishan Yang, "Demystifying the Resilience of Large Language Model Inference: An End-to-End Perspective", *SC '25*, https://dl.acm.org/doi/full/10.1145/3712285.3759803.
[acceptance rate: 21.2%]

[C.2] Dongwoo Kang, Akhil Perincherry, **Zachary Coalson**, Aiden Gabriel, Stefan Lee, and Sanghyun Hong, "Harnessing Input-Adaptive Inference for Efficient VLN", *ICCV '25*, https://arxiv.org/abs/2508.09262.
[acceptance rate: 24.0%]

[C.1] **Zachary Coalson**, Gabriel Ritter, Rakesh Bobba, Sanghyun Hong, "BERT Lost Patience Won't Be Robust to Adversarial Slowdown", *NeurIPS '23*, https://openreview.net/forum?id=TcG8jhOPdv.
[acceptance rate: 26.1%]

Preprints

[P.2] **Zachary Coalson**, Jeonghyun Woo, Chris S. Lin, Joyce Qu, Yu Sun, Shiyang Chen, Lishan Yang, Gururaj Saileshwar, Prashant Nair, Bo Fang, Sanghyun Hong, "PrisonBreak: Jailbreaking Large Language Models with at Most Twenty-Five Targeted Bit-Flips", https://arxiv.org/abs/2412.07192.

[P.1] **Zachary Coalson**, Huazheng Wang, Qingyun Wu, Sanghyun Hong, "Hard Work Does Not Always Pay Off: Poisoning Attacks on Neural Architecture Search", https://arxiv.org/abs/2405.06073.

Research Experience

Influence Functions to Reduce Large Language Model Toxicity — *Dec 2024 – May 2025*

- Created a method that uses influence functions to attribute and suppress toxicity-promoting training data.
- Evaluated the method on four open-source large language models across three datasets.
- Achieved a 5–10× reduction in LLM toxicity in both pre-training and fine-tuning settings.

Bit-Flip Attacks to Jailbreak Large Language Models *April 2024 – Nov 2024*

- Created a comprehensive bit-flip attack pipeline.
- Evaluated the pipeline on eight open-source large language chat models across two tasks.
- Demonstrated state-of-the-art attack success while flipping minimal bits.

Data Poisoning on Neural Architecture Search *Dec 2023 – May 2024*

- Developed a novel framework to audit the robustness of NAS to data poisoning attacks.
- Applied the framework to three NAS algorithms and four data poisoning adversaries.
- Discovered that data poisoning can negate the benefit of NAS, and that robustness varies by data reliance.

Slowdown Attacks on Input-Adaptive NLP Models *Aug 2022 – Dec 2023*

- Designed an objective function and two slowdown attacks based on the state-of-the-art text attacks.
- Performed an evaluation of the attacks on three input-adaptive NLP models across seven datasets.
- Demonstrated 100% attack success and proposed potential countermeasures such as input sanitization.

Professional Academic Activities

Conference Presentations

- NeurIPS '25 Poster: *IF-Guide: Influence Function-Guided Detoxification of LLMs* *Dec 2025*
- ICCV '25 Poster: *Harnessing Input-Adaptive Inference for Efficient VLN* *Oct 2025*
- NeurIPS '23 Poster: *BERT Lost Patience Won't Be Robust to Adversarial Slowdown* *Dec 2023*