Andrew Geyko

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Summary

Systems-oriented PhD student interested in checkpointing and migration mechanisms for large-scale machine learning and distributed systems. Research interests include fault tolerance, system elasticity, and the application of checkpointing techniques across diverse computing environments.

Work Experience

Research Intern - Santa Fe Institute Jun 2023 - Aug 2023

- Designed and developed **1D-ConceptARC, a novel benchmark** dataset inspired by the ARC (Abstraction and Reasoning Corpus) framework, to evaluate systematic reasoning and generalization in large language models.
- **Conducted experimental evaluations** on curated diverse one-dimensional reasoning tasks, and established baseline results for future research comparisons.

Research Assistant - The University of New Mexico Jan 2023 - Sep 2024

- Worked at the **Scalable Systems Lab**
- Conducted research on **locality-aware GPU-to-GPU communication mechanisms** in high-performance computing environments, focusing on improving data transfer efficiency.
- Developed and implemented a **novel communication algorithm** using CUDA, C++, and MPI, achieving measurable performance improvements over existing approaches.
- **First-authored** a peer-reviewed publication presenting the algorithm and its empirical results.

Leadership Positions

Internal Student Representative - MPI-SWS

Education

2024 - present	PhD (Computer Science) at **Max Planck Institute for Software Systems**
2023	Study Abroad at **University of Bergen**
2020 - 2024	Bachelor's Degree (Computer Science) at **The University of New Mexico** (GPA: 4.12/4.33)

Publications

Geyko, Andrew et al. (2024). "A More Scalable Sparse Dynamic Data Exchange". In: *2024 IEEE 31st International Conference on High Performance Computing, Data, and Analytics (HiPC)*, pp. 143–154. DOI: 10.1109/HiPC62374.2024.00023.

Last updated: October 7, 2025