Matthew Thomas Pisano

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Skills and Experience

- **Research** *(3 years)*: Peer-reviewed publications, academic talk invitations, work in indistry/academic research labs.
- **Teaching** *(3 years)*: Experience holding lectures, managing curricula, designing assignments, testing/grading.
- **Machine Learning** *(3 years)*: Transformer models, AI alignment research, RL, NLP, ASR, PyTorch, CUDA.
- **Python Programming** *(5 years)*: PyTorch, HuggingFace, data analysis, LLM fine-tuning, distributed systems.
- **Software Development** *(5 years)*: DevOps, CI/CD, Agile methodologies, web development, project leadership.
- **Awards and Certifications:** SUNY NP outstanding graduate, 1^{st} place globally at Mega-Ace hackathon, Eagle Scout.

Research and Publications

- **Bergeron: Combating Adversarial Attacks through a Conscience-Based Alignment Framework**. A weak-to-strong generalization framework for alignment. Involves an LLM acting as the "conscience" of a larger, more capable LLM. Accepted at the RPI Graduate Research Symposium. Published to *ProQuest*. ArXiv: 2312.00029
- **Moral High Ground: A Text-Based Games Benchmark for Moral Evaluation**, under *IBM*. A novel benchmark for evaluating the moral reasoning abilities of LLMs through conversational text-based games.
- **PredictChain: Empowering Collaboration and Data Accessibility for AI in an Algorand Blockchain-based Marketplace**. Research article on the development of *PredictChain*, a decentralized machine learning marketplace. 1^{st} place global hackathon winner. Presented at *ChainScience* 2023. ArXiv: 2307.15168
- **On Picard Groups and Jacobians of Directed Graphs**. Linear algebra and combinatorics study of *Chip-Firing games* and how graph edge manipulations affect game state evolution. Presented at *JMM* 2023 and published in the journal *Linear Algebra and its Applications* Vol. 711, P. 180-211.

Work Experience

- **IBM**: *Staff Software Engineer* (2025-Present), Poughkeepsie, NY. Low-level C/C++ development for compiling PyTorch models onto IBM's *Sypre* AI accelerator chips. Work with attention mechanism optimization, tensor manipulation, and PyTorch graphs. Participation in regular volunteering, community outreach, and education programs.
- **SUNY Ulster**: *Computer Science Adjunct* (2025-Present), Stone Ridge, NY. Instruct *Architecture and Organization* course. Lecture, manage curriculum, grade student work, attend faculty meetings, and coordinate with colleagues.
- **FileScience**: *Quality Assurance Lead Engineer* (2020-2025), Kingston, NY. Develop complex, distributed cloud-to-cloud backup software and ensure code is up to industry standard testing and documentation practices. Coordinate with team members to regularly review algorithms and methodologies.
- **Substrate AI**: *Research Engineer* (2024), Madrid, Spain. Development of a small *Metacontrol* LLM that evaluates whether user queries violate a policy set before being sent to a more generalized assistant. Used *LoRA* fine-tuning and dataset cleaning to generate high-quality results from sparse, synthetically generated data.
- **IBM Research**: *Research Extern* (2023), Yorktown Heights, NY. Research into LLM alignment using moral principles through fine-tuning on text-based games. Generated a diverse conversational dataset of moral situations and trained LLMs to extract the embedded ethical principals.

Education

- **Rensselaer Polytechnic Institute** (2023-2024), Troy, NY. *Master of Science* in Computer Science, published thesis on artificial intelligence alignment. 4.0 GPA, awarded TA position and scholarship. Classes in cognitive science, informatics, learning theory, reinforcement learning, information retrieval, parallel computing, and program analysis.
- **SUNY New Paltz** (2021-2022), New Paltz, NY. *Bachelor of Science* in Computer Science (Minor in Applied Mathematics), undergraduate research. 4.0 GPA, *Outstanding Graduate honor*, and published undergraduate research.