Reece Shuttleworth

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Education

- **Massachusetts Institute of Technology** Cambridge, MA
  BS & MEng, Computer Science & Cognitive Science *Sep 2021 – May 2025*
  - **Coursework:** Algorithms I & II, Machine Learning, Deep Learning, TinyML, Linear Algebra, Probability, Computational Cogsci, AI Ethics, Game Theory, Hardware for Deep Learning
  - **Master's Thesis**: Towards a Spectral Understanding of Language Model Fine-Tuning
  - **GPA**: 4.9/5.0

Experience

- **MIT CSAIL** Cambridge, MA
  Language & Intelligence Group Researcher *Feb 2024 – present*
  - Studying LLM fine-tuning. Published paper currently under review.
- **Google DeepMind** New York City, NY
  Research Engineering Intern *Jun 2024 – Aug 2024*
  - Implemented and ran hundreds of experiments across thousands of TPUs to measure and improve Gemini's factuality, especially in multi-modal contexts.
  - Aligned state-of-the-art factuality auto-classifier with human factuality labels.
- **Cleanlab** San Francisco, CA
  Machine Learning Engineering Intern *Jan 2024 – Mar 2024*
  - Developed and implemented novel ways to detect data issues in order improve data quality.
  - Wrote in production code to detect low quality text with high precision.
- **Numenta** Redwood City, CA
  Software/Machine Learning Engineering Intern *May 2023 – Aug 2023*
  - Created novel PEFT fine-tuning methods for LLMs to meet strict customer and hardware constraints.
  - Wrote code to support efficient sparse neural networks.
- **MIT CSAIL** Cambridge, MA
  Undergraduate Researcher *Dec 2021 – May 2023*
  - Studied LLMs and their use cases. Published separate papers in NeurIPS FMDM '22(100+ citations) and PNAS '22(150+ citations).

Selected Work

- **Analyzing Inference Optimizations for Transformers** (*reeceshuttle.me/assets/6.5930_Project.pdf*)
  - Studied inference optimizations in the attention module of transformers.
- **Sparsity in Transformers** (*github.com/reeceshuttle/958*)
  - Systematically measured the sparsity of weights and attention scores across several transformer models.
- **Bias in BERT Models** (*github.com/reeceshuttle/63950)*
  - Examined bias in BERT models and used finetuning with a novel loss function to try to reduce bias.
- **MIT Pokerbots** (*github.com/reeceshuttle/poker-bot)*
  - Placed in the top 10% of entries in 2023 MIT Pokerbots competition and awarded a cash prize.
- **Gabor filter-constrained CNNs** (*github.com/samacqua/gabor-constrained-nns*)
  - Trained unique Convolutional Neural Networks by seeking inspiration from the human brain.
- **PyTorch, but in NumPy** (*github.com/reeceshuttle/numpytorch)*
  - Implemented basic PyTorch functionality using only NumPy arrays.

Technical Skills & Interests

- **Languages**: Python, C, C++, HTML/CSS, JavaScript, Julia, LaTeX, RISC-V, R
- **Tools/Frameworks**: PyTorch, JAX, Git, Docker, WandB, AWS
- **Interests**: AI, neuroscience, reading, hiking, aviation, space flight, history