T. BEN THOMPSON

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EDUCATION

- **Harvard** Ph.D., Earth and Planetary Science *2019*
- **MIT** B.S. Earth, Atmospheric and Planetary Science *2013*

EXPERIENCE

Confirm Labs, Co-founder *Dec 2021 - present*

- **Algorithmic redteaming of LLMs:** Optimizers and objectives for powerful and fluent automated adversarial attacks on large language models. "Fluent Student-Teacher Redteaming."
- **Feature visualization for LLM interpretability:** Discrete optimization to construct text that strongly activates internal neural network features. "Fluent Dreaming for Language Models."
- **Computational statistics proofs:** Software for trillions of drug trial simulations over distributed GPU clusters. "A Rigorous Framework for Type I Error Control."
- **Fast Bayesian methods:** JAX-based implementation of the INLA algorithm for efficient inference of experimental drug trial outcomes. "Nano-second Bayesian inference."
- **Funding:** Raised $1M in seed funding (2022) and ongoing UK AISI contract (2024)

QuantCo, Senior ML Engineer *Nov 2017 - Oct 2021*

- **E-commerce demand forecasting:** Engineering and ML lead for a time-series ML system that forecasted sales for 2M products and $4B of revenue.
- **Statistical software development:** Implemented and parallelized numerical optimization algorithms. Co-creator of glum (25k downloads/mo) and tabmat (27k downloads/mo) for generalized linear statistical models and fast mixed dense/sparse matrix operations.
- **Software/data/ML engineering:** Collaborated with economists to analyze big data and build high performance production data and ML systems. E-commerce, health and P&C insurance applications.
- **Management and client relationships:** Advised junior engineers, developed interview content, handled technical collaboration with clients.

Harvard, DoE Computational Science Graduate Fellow (CSGF) *2013 - 2019*

- **GPU-accelerated numerical software:** Developed and implemented GPU-accelerated PDE solvers enabling 3D geometrically accurate earthquake simulation. (paper) – integral equation tutorials for earthquake and tsunami models.
- **Physics-based earthquake simulation:** Geometrically realistic simulations of earthquake activity in the Pacific Northwest to identify magnitudes and spatial extents of damaging events. (paper)
- **Neural networks:** Trained nets to compute complex viscous and elastic physical behavior 500x faster than prior numerical methods. (paper)
- Creator of cppimport for easy interfacing of C and C++ with Python - >1100 stars on GitHub.

Oak Ridge National Lab, Researcher *Sep 2015 - Nov 2015*

- C++ systems and performance engineering for a framework to automatically distribute large calculations over the Titan supercomputer. Tested on 1M+ row/column dense SVD and QR decompositions.

TherapyCharts, Software Engineer *Jun 2007 - Sep 2011*

- Designed, built and successfully launched a web-based electronic health record system for therapists using Python, PostgreSQL, Javascript.

TOOLS

Python, C++, CUDA, PyTorch, JAX, MPI, SQL, AWS, Git, Linux, Javascript