Rex W. Douglass, Ph.D.

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Applied Scientist — AI, ML, Causal Inference

I build things. I've turned research into working systems at Princeton, UCSD, Microsoft, robotics and agentic commerce startups, and through my own consulting companies.

I've Built

AI agents & evaluation

- **Agentic coding orchestrators** that turn intentions into observable outcomes, allocate and balance resources, monitor progress and problems, and route work across cloud and local GPU models by measured cost and success rate
- **Agentic research systems** that collect, source, and cross-check evidence in a queryable knowledge base
- **Measurement models for AI evaluation** that grade AI agents' work using inter-rater agreement and item response theory
- **Agentic commerce simulators** that model customer–agent interactions with provable game-theoretic measures of misbehavior
- **LLM information extraction systems** for data center construction permits, environmental permits, and vendor invoices

Vision, sensing & devices

- **Machine vision pipelines** for 3D mapping of physical spaces and robots, and for simulating failures and dangerous events
- **LiDAR and stereo RGB camera fusion rigs** for high-fidelity mapping of spaces and actions
- **Tool-assisted supervised labeling pipelines** for images and text
- **Assistive learning technology** for kids with ADHD: adaptive worksheets with a desk companion that tracks progress and focus

Text, events & forecasting

- **Large-scale event extraction NLP pipelines and ontologies** for monitoring international wars and crises
- **Text-as-data pipelines** for diplomatic telegrams, named entities for social science (NESS), and topic models of research papers
- **Bayesian forecasting and changepoint models** for COVID-19 cases, international war events, military disputes, and public opinion from search behavior
- **Real-time measurement strategies** for hard-to-measure outcomes, e.g., population from cell phone and satellite data

Experience

Principal Applied Scientist (AI & Systems Architecture) — Realign Labs — **Oct 2025–Oct 2026**
Led applied science and architecture for agent-to-agent commerce: market simulation, misbehavior measurement, and evaluation.

Principal Applied Scientist — RIOS Intelligent Machines — **Jul 2025–Mar 2026**
Rebuilt and automated the image labeling pipeline for training object detectors on edge robotics devices. Full-time until joining Realign Labs, then contract.

Senior Data and Applied Scientist — Microsoft — **May 2023–Jul 2025**
Built the group's LLM experimentation infrastructure from proof of concept through pilot, and developed information extraction pipelines for legal, accounting, and product-delivery use cases.

Director — Machine Learning for Social Science Lab - UCSD — **2016–2022**
Led research design and the technology stack for $5M in externally funded research; directed a team of postdoctoral, graduate, and undergraduate researchers.

President — Stability Analytics Incorporated — **2016–2025**
Concurrent applied science consulting: owned technology, research design, and sales for $500K+ in corporate research contracts.

Postdoctoral Scholar — Department of Mathematics - UCSD — **2012–2015**
Ran the machine learning stack and data acquisition and management for a team of mathematicians.

Education

Ph.D., Politics — Princeton University — **2009–2012**
Dissertation work on quantitative approaches to military intelligence, including wartime interviews in Kabul, Afghanistan and de-classified historical archival work in the U.S.

M.A., Politics — Princeton University — **2007–2009**
General exam in Quantitative Methods & Game Theory, American Politics, and International Relations

B.A. — University of Texas at Austin — **2003–2007**
Led large scale document digitization project on nuclear weapons proliferation across 7 archives in U.S., U.K., and India

Technical Skills

AI systems: LLM Agents & Tool Use (MCP) | Agentic Coding (Claude Code, Codex) | LLM Information Extraction | AI Evaluation & Inter-rater Agreement | Machine Vision (YOLO, DINOv3, Depth-Anything) | Local LLM Inference (vLLM)
Statistical methods: Causal Inference | Bayesian Hierarchical Models | Item Response Theory & Measurement | Forecasting & Time Series | Spatial Statistics | Boosted Trees (XGBoost, LightGBM)
Engineering: Python | SQL & PostgreSQL/PostGIS | PyTorch | JAX/NumPyro | R | Azure | Git/GitHub | Linux