Monica Spisar, PhD

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PROFESSIONAL EXPERIENCE

Machine learning software engineer: AI alignment @ Softmax, USA **2025 - current**

- Softmax develops multi-agent reinforcement learning simulations focused on social learning scenarios.

Machine learning engineer | Software engineer: participant @ Recurse Center, USA **2021 & 2024**

- Participated in two full sessions (3 months each) of RC's self-directed learning retreat for software engineers.
- Built and evaluated transformer neural networks, convolutional neural networks, generative adversarial neural networks in Python, PyTorch.
- Speed-ran ARENA materials: basics of mechanistic interpretability for the transformer architecture.
- Built a neural network from scratch in Python for a blog post on design considerations driving the multilayer perceptron architecture and stochastic gradient descent learning algorithm.
- Built a Rust ray tracer. Wrote a blog post covering the details of memory management in Rust.
- Built a Python ray tracer while completing Python for Data and Computer Science - MIT 6.000

Software engineer | Data engineer: censorship circumvention software @ Lantern, USA **2022 - 2024**

- Member of a technical team responsible for delivering a globally distributed service to millions of concurrent users.
- *Data engineering & analytics*
  - Designed and built a real-time data pipeline: OpenTelemetry (instrumentation, collector) streaming to GCP/BigQuery, monitored with Honeycomb, Datadog; the system handled peak throughputs of 1.5 MiB/s reliably. Conducted a data warehouse migration: Rockset to GCP/BigQuery. Optimized for efficient, cost effective querying of terabytes of data. Reduced data storage and processing costs by 50%.
  - Instrumented a substantial codebase to emit observability and usage data; improved outage recovery times.
  - Created metrics and dashboards to support developer, infrastructure, business, and client services teams.
- *Backend & Infra*
  - Wrote code for core services.
  - Configured, deployed services to cloud providers and monitored system performance.
- Worked with Go, Python, Rust, GCP, Docker, Terraform, OpenTelemetry, Superset, BigQuery, Honeycomb, Datadog.
- Coordinated data privacy policy updates with forward deployed team members; supported internal adherence.
- Participated in hiring/interviewing processes; helped onboard new team members.

Portfolio Manager | Scientific Liaison: longevity bioscience research @ University of Oxford, UK **2019 - 2021**

- Oversaw a research portfolio under a broader program accelerating drug discovery for longevity interventions.
- Built and delivered a $1.2MM bioscience research portfolio of longevity-focused drug discovery projects.
- Scouted, scoped projects: >50 research proposals in under 6 months.
- Led grant funding process: Developed funding guidelines, award process protocols, engaged expert reviewers, authored summary materials for the Advisory Board.
- Drafted original research proposals for sister portfolios under the funding umbrella.
- Managed a complex mix of disparate advisory board objectives. Mentored new team members.
- Additional details: monicaspisar.com/posts/hedging-bets-longevity**.**

COO: geoscience research @ Mineral Deposit Research Unit, University of British Columbia, Canada **2013 - 2015**

- Co-led strategy for research and training initiatives, sponsorships, fundraising.
- Led operations, finance (budget O($MM)), core team.
- Redesigned operations with transparent, intuitive systems to support a distributed research team.
- Board liaison. Point person for stakeholder engagement and management.
- Resolved friction points between industry expectations and institutional inertia.
- Planned and executed a unit reorganization to increase impact and operational effectiveness.

Program Manager & Industry Grants Officer @ University of British Columbia, Canada **2011 - 2013**

- Targeting MD/PhDs, delivered a program for cross-disciplinary training and development of entrepreneurial skills. A key outcome: the founding of a 3D tissue printing startup, now a thriving company - Aspect Biosystems.
- Oversaw industry grants (university-wide): Negotiated 200+ industry-academia agreements annually, working within the University-Industry Liaison Office and in close coordination with UBC Legal and Finance.

Research engineer | Data scientist: medical devices @ Kardium (Employee #16), Canada **2008 - 2011**

- *Device delivery guidance* - Led deployment imaging for a class III medical device for transcatheter mitral valve repair. Integrated multiple medical imaging modalities to meet requirements for accurate catheter delivery guidance.
- *Product R&D* - Led device performance characterization (computer simulations, lab), preclinical trial design, initial clinical evaluation for a class II device for sternal closure. Field research: observed coronary artery bypass surgeries and cath lab procedures, worked closely with expert clinicians to define specs (performance and UX).
- Participated in hiring processes, onboarding. The team grew to >30 people during my tenure; we worked on a highly effective consensus model for R&D and hiring decisions.
- *Patents* - 8888791, 9700363

EDUCATION + RESEARCH TRAINING

Postdoctoral Research Scientist, Laboratoire d'imagerie biomédicale @ Sorbonne University, France

Led research on high resolution ultrasound imaging of angiogenesis. Computer simulations of particle flow. Designed and built a microfluidics vascular prototype for high resolution ultrasound imaging. Mentored doctoral students.

PhD, Biomedical Engineering (Medical Imaging), University of Michigan, USA

Thesis - Optoacoustic detector arrays for medical imaging applications.

Thesis research - Designed, built, tested a laser-based ultrasound imaging system with novel detection technology. Met clinical requirements for imaging sensitivity and resolution for a catheter-based imaging device. Built the optical system and tuning electronics. Wrote custom signal capture, processing, and image reconstruction software. Work focused on subnanometer control of effective optical path length across a synthetic array detector. Improved sensitivity by 10x. Mentored an undergraduate assistant. Presented results at conferences.

Pre-thesis research - Designed and tested a compact scintillation (gamma) camera for early breast cancer detection. Applied statistical image reconstruction methods to identify optimal detector configuration. Customized Monte Carlo photon transport simulation software (in C) for parallel processing. Built and evaluated a prototype gamma camera.

Teaching - BME510 Medical Imaging Lab - TA

BSc, Physics, University of Toronto, Canada

PEER-REVIEWED PUBLICATIONS

Google Scholar | ResearchGate

PERSONAL BLOG *samples from https://monicaspisar.com*

Designing neural networks | Rust: Memory management | OpenTelemetry Collectors for all | Picture perfect: AI + medical imaging | Building a longevity bioscience portfolio | Mainstreaming longevity

SOFTWARE SKILLS

- *Machine learning*: PyTorch, scikit-learn, NumPy, SciPy, Pandas, matplotlib, MATLAB, MCP, LangChain
- *Data*: PostgreSQL, Redis, BigQuery, dbt, Cosmos, Airflow, OpenTelemetry, Looker, Honeycomb, Datadog
- Python, Go, Rust, SQL, TypeScript/JavaScript, React, Node/Next.js, FastAPI/OpenAPI
- GCP, AWS. Docker, Terraform. Git, shell/Bash. Claude Code, GitHub Copilot

SOFTWARE PROJECTS *samples from https://github.com/msyvr*

AI safety forecasting | Data extraction from text | Neural network from scratch | OpenTelemetry Collector + exporter