

MICHAL BOREK

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Languages: Polish (native), English (fluent)

FIELD CONSULTANT (AI SOLUTIONS):

Consulting-minded software engineer with strengths in **client discovery, solution delivery, and enablement** for AI/data workflows. Shipped AI-assisted HPC tooling used by **~50 active accounts** and delivered reproducible ML pipelines for safety-critical medical imaging. Comfortable presenting, running live demos, training users, and translating ambiguous needs into reliable systems (validation, guardrails, auditability). **Co-author: SPIE Medical Imaging 2025; Radiology: AI (under review).**

Core Consulting Strengths: requirements & discovery • stakeholder communication • solution design • user enablement/training • demos & workshops • reliability/testing • production-minded AI (guardrails, validation) • HPC/scale fluency

TECHNICAL SKILLS

Languages: Python, C++, Bash, SQL (PostgreSQL)

Backend/Dev: Flask, FastAPI, Docker, Git, Linux

Data/ML: Pandas, NumPy, scikit-learn, PyTorch, TorchXRyVision, Captum

HPC/Distributed: SLURM, CUDA, PyTorch DDP, Singularity, MSU HPCC

LLM/RAG: Ollama, Qdrant, PostgreSQL FTS, citation-backed RAG, verification/refusal patterns

Tooling: ShellCheck, Jupyter

EDUCATION

Michigan State University, College of Engineering (Honors College)

Expected May 2026

Bachelor of Science, Computational Data Science, Minor in Mathematics.

GPA: 3.84

EXPERIENCE

Institute for Cyber-Enabled Research (ICER), Michigan State University

East Lansing, MI

AI Engineer Intern (HPC / ML Tooling)

Jun 2023 – Present

- Shipped a **SLURM job-script validator** (custom #SBATCH checks + ShellCheck + LLM review via Ollama) to reduce submission errors and speed triage across the cluster.
- Deployed a **Flask service + CLI** on Open OnDemand with a live editor, real-time analysis, and a SLURM chat assistant; accessible to the HPCC user community (**~200+ accounts**).
- Integrated a **policy-constrained LLM** limited to approved checks/outputs to improve reliability and reduce unsupported responses in user guidance.
- Presented the AI agent at **Mid-SURE 2025** (MSU): led a live demo and Q&A with faculty and students.
- Authored an HPCC module for **LM Studio** enabling one-command LLM workflows under SLURM; tested **H200 GPUs** for inference throughput.
- Designed and delivered a short **Python training track for HPC users** (intro/OOP, NumPy, project structure), integrated into ICER materials.

Institute for Quantitative Health Science & Engineering (IQ)

East Lansing, MI

Deep Learning Research Assistant (Medical Imaging ML)

Nov 2023 – Present

- Built a modular **PyTorch** pipeline for **ordinal classification** with fully reproducible runs (data curation, training/evaluation, automatic report bundles).
- Owned hyperparameter optimization and model selection end-to-end using held-out metrics and calibration; executed sweeps and tracked performance.
- Scaled training via **PyTorch DDP** on CUDA/SLURM (MSU HPCC), cutting wall-time from **~8h to ~3h**; improved preprocessing efficiency (e.g., Lanczos resizing).

- Supported clinical review with model interpretability using **Captum** saliency; disseminated results via **SPIE 2025** and a **Radiology: AI** submission (under review).
- Delivered an oral presentation at **UURAF 2025**.

MSU Housing & Residence Education

East Lansing, MI

Resident Assistant

Aug 2024 – Present

- Mentored **100+ residents** through 1:1 support, academic planning, and resource referrals; built an inclusive community and improved engagement.
- Led academic/wellness/DEI programs and executed on-call operations (rounds, incident response), including logistics, promotion, risk management, and documentation.
- Mediated conflicts and drafted roommate agreements; resolved issues aligned with policy and safety standards.
- Recognized with the **REHS Excellent Teamwork Award (2025)** for collaboration and reliability under pressure.

Department of Computer Science at Michigan State University

East Lansing, MI

Undergraduate Teaching Assistant

Dec 2022 – Dec 2023

- Led weekly recitations for **~40** students, translating core CS concepts into hands-on problem solving and **debugging workflows**.
- Built an **auto-graded lab suite (unit tests + rubric-based checks)** that improved turnaround time by **~30%** and supported a **12%** exam performance increase.

PROJECTS

*Delta Dental Capstone - **Project Lead** (Client-Facing Data Science)*

Jan 2026 – Present

- Lead partner-sponsored capstone with **Delta Dental Data Science Team**; run working sessions to align scope, milestones, and deliverables.
- Build a **canonical dataset** (stable schema + data dictionary) by consolidating source tables for consistent downstream use.
- Prototype **feature mapping to a 3D model** for interpretable visualization and consistent feature semantics.

Legal Document Intelligence System (RAG)

Dec 2025 – Present

- Built an **end-to-end RAG** system for legal documents (PDF/DOCX/TXT) with citation-backed responses using hybrid retrieval (**PostgreSQL FTS + Qdrant**) and local Ollama inference with structured outputs.
- Implemented mandatory **verification + refusal** (claim to source validation, excerpt generation) and an asynchronous API/worker architecture with **audit logging**, retries, and safe concurrency.

Dark Vision – Nighttime Animal Classification for Driver Safety

Jan 2026 – Present

- Improved test accuracy from **14.27% to 92.62%** on an 8-class **~16.9k-image** dataset via data curation and ResNet-18 fine-tuning; validated with per-class F1 and confusion-matrix review.
- Ran low-light robustness tests: Cross-Entropy gave best dark-only accuracy (~45.5%), while Focal Loss improved macro-F1; removed mislabeled “night” images to prevent class collapse.

PUBLICATIONS

- **Liu, M.**, Loveless, I., Huang, Z., **Borek, M.**, Rosenman, K., Alessio, A., Wang, L. “Ordinal classification framework for multiclass grading of pneumoconiosis.” *SPIE Medical Imaging 2025: Computer-Aided Diagnosis*, 13407:134072Q, April 2025. **doi:10.1117/12.3046353**
- **Wang, L.**, Liu, M., Huang, Z., Loveless, I., **Borek, M.**, Rosenman, K., Alessio, A. “Pneumoconiosis Multi-task Screening and Classification using Fine-Tuned Deep Learning Models.” *Radiology: Artificial Intelligence*, under review, 2025.

LEADERSHIP & AWARDS

Polish Club, Michigan State University – Co-Founder/ E-Board

Oct 2024 – Present

- Co-created student organization; lead meetings and event planning; coordinate outreach and onboarding.
- Awards:** REHS Excellent Teamwork Award (2025) • Dean’s List (6/7 terms) • EGRID Silver Scholarship (2024) • International Tuition Grant (2022)