

Karthik Gaur

Scientific machine learning | Self-supervised vision | Applied ML systems
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EDUCATION

University of Alabama

B.S. Computer Science, Mathematics minor | GPA: 3.81/4.0

Expected May 2027

RESEARCH

Data Science Lab, University of Alabama

Artificial Intelligence Researcher | Advisor: Dr. Sergei Gleyzer

Dec 2025 - Present

Researching scientific ML and core AI, with a focus on AI agents, representation learning, and JEPA models.

- Mentored and co-authored Lens-LeJEPA, accepted as a poster at the NeurIPS 2026 RPS Workshop.
- Built a polar coordinate prior for self-supervised strong-lens representations; manuscript under review at the ML4PS 2026 Workshop.
- Researching LLM-agent behavior, with a manuscript under review at ICLR 2027.
- Building an AI-agent framework for high-energy physics through the UA-Fermilab DOE Genesis Mission project, with Google and NVIDIA as industry partners.

PUBLICATION

Lens-LeJEPA: Learning the Right Invariances for Strong Gravitational Lenses

Co-author | NeurIPS 2026 RPS Workshop | Accepted poster; camera-ready pending

INDUSTRY EXPERIENCE

Alabama Credit Union

Data Engineer Co-op

May 2026 - Present

- Analyze fraud and ACH transactions; build fraud-probability models and stakeholder dashboards.
- Won the company-wide intern pitch competition (12 competitors); secured executive funding for a charity partnership.

The Westervelt Company (via Alabama Productivity Center)

Data and AI Intern

Jan 2025 - May 2026

- Prototyped Cervus with FastAPI, Ollama, and PostgreSQL: schema retrieval, SQL validation, read-only access, and visible queries. Projected potential savings: 500 analyst hours/year.
- Automated Python/SQL reporting, reducing manual handling by approximately 70%; built a Power BI dashboard associated with approximately 160 hours of annual savings.

The Westervelt Company (via Alabama Productivity Center)

Software Developer Intern

May - Aug 2024

- Built asset tracking across 11 production sites; contributed Pytest/model_bakery tests and rollout coordination. Delivered 10 pull requests and 14 issue fixes across 16 Django applications.

SELECTED PROJECTS

UA Parking Intelligence | Python, Next.js, Gemini

Built ETL, redaction, analysis, and source-linked retrieval for 1,766 survey responses. Co-presented findings to UA Parking in April 2026. Public demo uses synthetic data.

IRIS | Next.js, Gemini, MediaPipe

Built a browser object-finding prototype with voice input, pretrained vision, hand tracking, and audio/haptic guidance; coordinated feedback with smoothing and arrival checks.

LEADERSHIP & SKILLS

GSoc Mentor, ML4SCI / DeepLense (May - Aug 2026): guided two researchers toward workshop submissions.

SGA Treasurer, University of Alabama (Mar 2025 - Apr 2026): oversaw \$1.07M for 500+ student organizations.

Languages: Python, C++, SQL, JavaScript/TypeScript. **ML:** PyTorch, scikit-learn, NumPy.

Engineering: FastAPI, Django, React/Next.js, PostgreSQL, Git, Linux, Docker, Pytest.