Kajal Patel

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Education

University of Illinois at Urbana-Champaign **Expected Graduation: May 2026**
Bachelor of Science in Computer Science, *Minor in Statistics, Minor in Psychology* *GPA: 3.97 / 4.00*

Relevant Coursework

- Applied Machine Learning
- Computational Photography
- Algorithms
- Artificial Intelligence
- Deep Learning for Computer Vision
- Programming Languages & Compilers
- Numerical Methods
- Statistics & Probability
- Data Structures
- Database Systems
- Linear Algebra
- Computer Architecture

Skills

Technical: Python, Java, C++, SQL, R, C, Numpy, Neo4J, MongoDB, Tensorflow, Pytorch, Matplotlib, Pandas, Scipy, JavaScript
Spoken languages: English, Hindi, Spanish, Gujarati

Research and Work Experience

Perception and Language (PLAN) Lab *(Advisor: Dr. Ismini Lourentzou)* **August 2024 – Present**
National Center for Supercomputing Applications Research Intern *Urbana-Champaign, IL*

- Research Scene Graph Generation to overcome limitations of closed vocabularies and biases toward frequent objects.
- Integrate Large Vision-Language Models with query transformers and a Hungarian matching algorithm to enhance prediction.
- Refine relation prediction and conducting ablation studies to further improve model performance and generalization.

Center for Exascale-enabled Scramjet Design **May 2024 – December 2024**
National Center for Supercomputing Applications Research Intern *Remote*

- Investigated array-based program transformations and optimizations in high-performance computing applications.
- Traced and unpack computations through directed acyclic graphs mapping static control programs with array input.

Sandia National Laboratories **May 2023 – Present**
Applied Machine Intelligence R&D Intern *Albuquerque, NM*

- Design a 3D reconstruction pipeline leveraging differentiable Gaussian splatting to enable view synthesis from X-ray projections.
- Integrate neural radiance field-based tomography to enhance sparse-view 3D reconstruction, improving fidelity with limited data.
- Formulate novel exhaustive evaluation framework for DOE-funded climate research RAG-based large language model.
- Experiment with natural language processing and metrics like latent dirichlet allocation to measure similarity in corpora of text.

Software R&D Intern

- Restructured the queuing and processing mechanism for satellite data streams, ensuring handling without overloading.
- Designed CI/CD version control pipeline to generate live changelogs in a conventional commit structure upon changes to a repository.

Computers and Education Research Group *(Advisor: Dr. Geoffrey Herman)* **August 2022 – Present**
Undergraduate Researcher *Urbana-Champaign, IL*

- Analyze second-chance testing regimens using student performance data to assess learning, retention, and course experience.
- Compare different exam structures across courses to evaluate trade-offs between frequency, second chances, and stress levels.
- Apply statistical analysis and survey data to assess student performance trends and perceptions of testing methods.
- Investigate strategies for optimizing assessments, balancing retrieval practice, remediation, and student well-being.

Statistics & Probability I, Numerical Methods, and Discrete Structures **August 2023 – Present**
Course Assistant *Urbana-Champaign, IL*

- Teach, hold office hours, and provide academic support to 1700+ students every semester across three core courses.

PeopleWeave, Caesar Research Group *(Advisor: Dr. Matthew Caesar)* **March 2023 – December 2023**
Undergraduate Researcher, Team Lead *Urbana-Champaign, IL*

- Spearheaded research and implementation of knowledge graph attention networks for academia-focused recommender systems.
- Held weekly team meetings and delivered progress reports to project managers and advisors.

Extracurricular and Leadership Experience

Girls Who Code **February 2021 – Present**
Lead Facilitator, Founder of Chapter *Urbana-Champaign, IL; Mundelein, IL*

- Create content for 100+ girls from grades 3-12 to code in Python, Java, HTML/CSS, and Javascript, teaching lessons for all levels.
- Coordinate students, parents, and 20+ facilitators to foster an inclusive and safe environment.

Awards

Stamps Scholar **Awarded April 2022**

- Received most prestigious and selective scholarship (four-year full-ride) at the University of Illinois at Urbana-Champaign.
- Selected on basis of leadership, academics, and service from amongst 475,000+ applicants.