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

Computer Science: Deep Learning for Computer Vision, Theoretical Machine Learning, Applied Machine Learning, Computational Photography, Artificial Intelligence, Mobile Robotics, Algorithms, Numerical Methods, Database Systems
Statistics: Linear Algebra, Statistics & Probability, Statistical Analysis, Statistical Programming Methods
Psychology: Decisions and Judgment, Personality Psychology, Brain and Cognition, Human Performance and Cognition

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

Affective Intelligence and Robotics Laboratory *(Advisors: Dr. Fethiye Irmak Doğan, Dr. Hatice Gunes)*   **May 2025 − Present**
Cambridge University Research Intern   *Remote*
- Analyze activation maps with GradCAM to study vision-language models' attention to affective regions in emotion interpretation.
- Design statistical tests of region activations to assess category-driven attention, exposing systematic biases in protected attributes.
- Evaluate captioning accuracy across categories to assess when models follow human cues versus rely on localized features.

Perception and Language (PLAN) Lab *(Advisor: Dr. Ismini Lourentzou)*   **August 2024 − May 2025**
National Center for Supercomputing Applications Research Intern   *Urbana-Champaign, IL*
- Researched Scene Graph Generation to overcome limitations of closed vocabularies and biases toward frequent objects.
- Integrated Large Vision-Language Models with query transformers and a Hungarian matching algorithm to enhance prediction.
- Refined 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 − June 2025**
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 as conventional commits 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.
- Investigate strategies for optimizing assessments, balancing retrieval practice, remediation, and student well-being.
- Published <u>results</u> at the 2025 ACM Conference on International Computing Education Research

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

Outstanding Research Intern   **Awarded May 2025**
- Recognized as an outstanding undergraduate researcher for work on open-vocabulary scene graph generation by the National Center for Supercomputing Applications.

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.