

# JIHYE LEE

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## RESEARCH INTERESTS

Artificial Intelligence, Machine Learning, Explainable AI, Natural Language Processing, Large Language Model, Computer Vision

## EDUCATION

**Boston University**, Boston, MA

*Expected May 2026*

B.A. in Computer Science

GPA: 3.93 / 4.00

Dean's List: Spring 2024

*Relevant Coursework:* Artificial Intelligence, Machine Learning, Deep Learning, Algorithms, Database Systems, Software Engineering, Calculus I–III, Linear Algebra, Probability and Statistics

**Temple University**, Philadelphia, PA

*Fall 2022 – Spring 2024*

B.S in Computer Science (Transferred)

GPA: 3.90 / 4.00

Dean's List: Fall 2023, Spring 2024

## EXPERIENCE

**Temple University, Human–Computer Interaction Lab**

*Oct 2023 – May 2025*

*Research Intern*

*Philadelphia, PA*

- Evaluated and compared the zero-shot Visual Question Answering (VQA) performance of trees
- Developed a dynamic image generator and trees using Python, NetworkX, and Matplotlib, enabling the creation of diverse, randomized data structure visuals
- Conducted a head-to-head comparison of GPT-4V and Gemini Pro Vision models, measuring their zero-shot accuracy in solving graph and tree data structure challenges, and visualized the competitive result with Matplotlib

**Harvard Medical School, Lee Lab**

*Jun 2021 – Sep 2021*

*Data Science Intern*

*Boston, MA*

- Engineered a robust computational workflow for scATAC-seq data analysis using R/R Studio, optimizing the process for efficiency and accuracy
- Proactively identified and resolved three critical dependency issues with R packages, ensuring seamless operation and stability of the workflow
- Visualized complex datasets from publicly available “Adult Mouse Brain” and “10X PBMC” studies, transforming raw data into insightful, interpretable visuals

## PUBLICATIONS

Gutierrez, S., Hou, I., **Lee, J.**, Angelikas, K., Man, O., Mettile, S., Prather, J., Denny, P., and MacNeil, S.

*“Visual Question Answering on Structured Data: Evaluating LMMs on Graph and Tree Reasoning.”*

ACM Digital Library, 2025. DOI: 10.1145/3716640.3716654.

## TECHNICAL PROJECTS

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### Dog Breed Classifier December 2025 (Expected)

- Built the full preprocessing and augmentation pipeline (stratified splitting, normalization, RandomResizedCrop, flips) and trained baseline CNNs in PyTorch.
- Fine-tuned pretrained ResNet-34, MobileNetV2, and EfficientNet-Bo models, comparing validation accuracy and loss to evaluate performance.
- Implemented an open-set “Unknown breed” recognition mechanism using calibrated confidence thresholds (max-softmax / energy score).

### Baymax Healthcare Companion December 2025 (Expected)

- Developed a multimodal healthcare dashboard inspired by *Big Hero 6*’s Baymax, integrating symptom logging, medication reminders, and prescription OCR.
- Built an AI-powered health chatbot using GPT-4o to analyze user inputs, provide personalized suggestions, and answer health-related questions.
- Designed a clean, intuitive interface enabling users to track symptoms, manage medication adherence, and visualize health trends through interactive charts.
- Implemented backend logic to parse, classify, and summarize user health data, generating personalized insights and automated alerts.

### AI Bitcoin Trader November 2024

- Developed an automated cryptocurrency trading bot integrating the Alpaca API with GPT-4-based sentiment analysis.
- Incorporated the Fear & Greed Index and Korean YouTube transcripts to produce context-aware trading signals.
- Visualized trade data using Streamlit and Plotly; logged transactions in SQLite for performance evaluation and optimization.

### COVID-19 2D Grid Spread Simulation May 2024

- Engineered a 2D grid-based agent model in MATLAB to simulate the spread of COVID-19, focusing on the effects of varying movement speeds on transmission dynamics.
- Strategically designed agents to move randomly with subtle directional changes, modeling infection transmission through interactions within grid cells.
- Conducted 1,000 simulations with different movement speeds, analyzing the impact on virus spread by collecting data on the statuses of susceptible, infected, quarantined, and immune agents.

## TEACHING & MENTORSHIP EXPERIENCE

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### Temple University Jan 2023 – May 2024 STEM Tutor Philadelphia, PA

- Tutored 100+ undergraduates in Calculus I–III, Python, Java, Data Structures, and Discrete Math.
- Provided individualized support and guided problem-solving strategies for diverse learners.

### Private Tutoring Spring 2024 AP Calculus Tutor Remote

- Guided several AP Calculus students, with over five earning a score of 5 on the AP exam.
- Created review sessions and mock exams to strengthen conceptual understanding and exam readiness.

### Upchieve (Nonprofit) 2020 – 2023 Volunteer Tutor Virtual

- Tutored elementary, middle, and high-school students nationwide in math and introductory computer science.
- Delivered one-on-one virtual sessions in algebra, pre-calculus, and basic coding; over 50 volunteer hours supporting underrepresented students in STEM.

## **Calvary Baptist Schools**

*Classroom Teaching Assistant (Grade 3)*

2021 – 2022

*Lansdale, PA*

- Assisted lead teacher in math & science instruction for 3rd-grade students.
- Designed engaging activities to reinforce early STEM concepts and classroom participation.

## **TEACHING ASSISTANT & LEADERSHIP EXPERIENCE**

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### **Boston University**

*Course Assistant, Web App Development*

2024 – Present

*Boston, MA*

- Assisted the instructor in facilitating class discussions, organizing review sessions, and mentoring 100+ students in React-based full-stack web development.
- Provided individualized feedback and guidance to help students grasp complex topics and improve code quality.
- Created supplementary learning materials (sample code, documentation) to enhance student understanding and engagement.
- Contributed constructive suggestions to improve course assignments and introduce modern development tools and best practices.

### **Association for Computing Machinery, Temple University**

*Finance Chair*

2023 – 2024

*Philadelphia, PA*

- Collaborated with university departments and sponsors to raise over \$1,000 for club initiatives.

### **Owl Hacks Hackathon, Temple University**

*Logistics Lead*

2023

*Philadelphia, PA*

- Delivered sponsor presentations and secured over \$1,500 in event funding.

## **TECHNICAL SKILLS**

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**Languages:** Python, Java, JavaScript, C/C++, OCaml, SQL, R, MATLAB, HTML/CSS

**Frameworks & Tools:** React, Streamlit, pandas, NumPy, Plotly, NetworkX, SciPy, MySQL, Jupyter Notebook, Git

**Specialties:** Machine Learning, Deep Learning, Data Visualization, AI-assisted Reasoning

## **AWARDS & RECOGNITION**

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**Dean's List**, Temple University — Spring 2023, Fall 2023

**Dean's List**, Boston University — Spring 2025

**STARS Celebration (2024)**: Research paper submission, *Visual Question Answering on Structured Data*