

# Priyanka Dey

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**Research Interests:** 3rd year PhD student interested in **personalization** and **cultural reasoning** in LLMs, focusing on improving models' cultural adaptability, reasoning fidelity, and user alignment.

## Education

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### University of Southern California

PhD in Computer Science

Los Angeles, CA

Aug 2023 - May 2028

- Advisors: Emilio Ferrara, Jieyu Zhao
- Honors: 2025 Capital One Research Fellow

### University of Illinois at Urbana-Champaign

MSc in Computer Science

Champaign, IL

Aug 2021 - May 2023

- Advisor: ChengXiang Zhai
- Thesis: *Time Series Analysis using Textual Data*

B.S. in Statistics and Computer Science

Aug 2017 - Dec 2020

## Select Publications [[Google Scholar](#)]

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### **GRAVITY: A Framework for Personalized Text Generation via Profile-Grounded Synthetic Preferences**

Priyanka Dey, Daniele Rosa, Wenqing Zheng, Daniel Barcklow, Jieyu Zhao, Emilio Ferrara [[preprint](#)]

### **Can LLMs Express Personality Across Cultures? Introducing *Cultural Personas* for Evaluating Trait Alignment**

Priyanka Dey, Yugal Khanter, Aayush Bothra, Jieyu Zhao, Emilio Ferrara [[EMNLP 2025 Findings](#)]

### **Can LLMs Grasp Implicit Cultural Values? Benchmarking LLMs' Cultural Intelligence with CQ-Bench**

Ziyi Liu, [Priyanka Dey](#), Jen-tse Huang, ..., Rahul Gupta, Yang Liu, Yao Du, Jieyu Zhao [[preprint](#)]

### **Coordinated Activity Modulates the Behavior and Emotions of Organic Users: A Case Study on Tweets about the Gaza Conflict**

[Priyanka Dey](#), Luca Luceri, Emilio Ferrara [[Web Conference 2024](#)]

### **Investigating Stylistic Profiles for the Task of Empathy Classification in Medical Narrative Essays**

[Priyanka Dey](#), Roxana Girju [[GURT 2023](#)]

### **Enriching Deep Learning with Frame Semantics for Empathy Classification in Medical Narrative Essays**

[Priyanka Dey](#), Roxana Girju [[EMNLP 2022 \(LOUHI\)](#)]

### **Fine Grained Categorization of Drug Usage Tweets**

[Priyanka Dey](#), ChengXiang Zhai [[HCII 2022](#)]

## Professional Research Experience

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### Motorola Solutions Group

Chicago, IL

NLP Research Intern

May 2024 - Aug 2025

- Developed a multi-task large language model (LLM) for 911 dispatch operations, supporting tasks such as call summarization and incident classification
- Designed an agentic LLM workflow integrating tool use and reflection to automatically extract and build structured entity profiles from 911 call transcripts
- Built a retrieval-augmented generation (RAG) framework enabling LLMs to parse natural-language operator inputs into actionable dispatch commands

Machine Learning Research Intern

- Developed appearance-based bias detection probes for computer vision models (e.g., CLIP)
- Built an image-text search API using fuzzy embedding retrieval (CLIP + SentenceBERT + BM25)
- Experimented with prompt-tuning via context vector optimization for relationship entity extraction tasks

## Morgan Stanley

Technology Analyst

New York, NY

Feb 2021 - Aug 2021

- Built dynamic dashboards (JMX Exporter, Prometheus, Grafana) to monitor internal app metrics and implemented anomaly alerting for proactive issue detection
- Trained regression models (XGBoost, GBM, MLP) to predict residual quantities of large, market-moving orders

Summer Technology Analyst

May 2020 - Aug 2020

- Built a novelty detector (Local Outlier Factor, Isolation Forests) to identify hours and traders with abnormal alerts
- Developed a Flask-based visualization tool (Chart.js) to interpret anomalies interactively (reducing detection time by ~3 hours)

Summer Technology Analyst

May 2019 - Aug 2019

- Designed a data pipeline (Hadoop) to store and query account position data efficiently
- Developed a Flask application for querying historical position data, reducing investigation time by ~5 hours

## John Deere

Intelligent Solutions Group Software Development Intern

Urbandale, IA

May - Aug 2018

- Developed a progressive web app (React.js) enabling remote display access (RDA) sessions (reducing login time by ~1 hour)

## Capital One

Intelligent Solutions Group Software Development Intern

Champaign, IL

Jan - May 2018

- Built a recommendation engine using market basket analysis (Apriori & Eclat) for client personalization
- Achieved ~70% user preference rate over the baseline recommendation system

## Additional Projects

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### Conversational Agent for Substance Use Recovery & Prevention (UPenn)

Advised by: Dr. Man-pui Sally Chan

July 2022 - July 2023

- Designed a motivational chatbot integrating mood classification and natural language generation modules to support behavior change
- Compared multiple deep learning architectures (LSTM, biLSTM, CNN, T5, BERT, RoBERTa) for emotion recognition and dialogue personalization

### Analyzing Food Inspection Officers for Bias and Fairness (UIUC + CUPHD)

Advised by: Professors ChengXiang Zhai and Ruqing Zhu

Sep 2022 - Dec 2022

- Applied text mining and NLP methods to identify bias in inspection reports across cuisines, using linguistic and statistical fairness analyses
- Built an interactive Elasticsearch-based dashboard to visualize disparities and support culturally aware public health insights

## Services

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- **Mentoring:** Mentor for undergraduates and master's students (UIUC, USC)
- **Leadership:** USC Undergraduate Research Mentoring Program organizer, UIUC WCS Ambassador, UIUC CS SAIL workshop organizer for high school students
- **Teaching:** Information Systems, Python Data Analysis (UIUC)

## Skills

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- **Frameworks:** PyTorch, TensorFlow, Hugging Face, LangChain
- **Languages:** Python, Java, HTML, CSS
- **DevOps:** Weights & Biases (W&B), MLflow, Git, Docker
- **ML Infra:** AWS, Spark, Hadoop, SQL, Elasticsearch
- **Annotation:** Amazon Mechanical Turk, Prolific