

Stanley N.

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RESEARCH INTEREST

I work at the intersection of Social Computing, Human Computer Interaction, and Artificial Intelligence, with the goal of designing AI systems that are technically robust, socially inclusive, and supportive of human cognition. My research focuses on how large language models can represent diverse societal values and how principles such as explanation, feedback, and decision support can reduce cognitive load and strengthen human problem solving. Methodologically, my work combines system building with transformer based modeling, multimodal analysis, and user centered data collection. Over the past two years, I have examined multimodal misinformation targeting marginalized communities and its perception by developing a secure end-to-end pipeline that collected TikTok browsing histories from Trans and Non-Binary participants, integrated Prolific surveys, and merged this information with large scale automated scraping. This system processed more than one million videos and three hundred thousand authors using GPU based frame extraction, OCR, and metadata enrichment, enabling topic modeling, clustering, and influence scoring to reveal misinformation patterns and creator dynamics. This experience has shaped my commitment to linking technical rigor with social impact, and I plan to pursue a Ph.D. in Computer Science to continue advancing research that connects **AI, HCI, and Social Computing**.

EDUCATION

University of Minnesota Duluth

Master of Science in Computer Science - CGPA: 4.0

Duluth, MN

Aug. 2023 – Aug. 2025

IIIT D&M Kancheepuram

Bachelor of Technology in Computer Science and Engineering

Chennai, India

Aug. 2019 – May 2023

RESEARCH AND TEACHING EXPERIENCE

Adjunct Faculty (Appointed for Spring 2026)

The College of St. Scholastica

Spring 2026

Duluth, MN

- Teaching *Coding in Java* and *Introduction to Machine Learning* as part of the Computer Science curriculum.

Graduate Research Assistant

Comp4SoG Lab - University of Minnesota, Duluth

Aug. 23 – Aug. 25

Duluth, MN

- Conducting research on "Investigating Multi-Modal Misinformation on Transgender and Nonbinary Issues on TikTok" under the guidance of Professor Md Momen Bhuiyan.
- Implemented **GPU-accelerated frame extraction** (FFmpeg) and **OCR** (PaddleOCR) for text/caption parsing with systematic metadata and engagement enrichment.
- Applied **BERTopic**, **K-Medoids clustering**, and influence scoring to model misinformation themes, creator dynamics, and amplification networks.
- Engineered a large-scale multimodal pipeline (Python, Node.js, MySQL, FFmpeg, PaddleOCR) to collect and analyze **1M+ TikTok videos** and **300k+ authors**, applying BERTopic, clustering, and influence scoring to study misinformation dynamics.

Graduate Teaching Assistant

Dept. of Computer Science - University of Minnesota, Duluth

Aug. 23 – Dec. 24

Duluth, MN

- Assisted in teaching CS-1, CS-1151: Introduction to Python, CS-4242/5242: Natural Language Processing, and CS-4442/5442: Parallel Programming.
- Led office hours and lab sessions that supported students across introductory and advanced courses, mentoring them in coding best practices, debugging complex logic and runtime issues, and applying performance optimization strategies. Provided targeted guidance on Python programming, NLP and parallel programming concepts.

Research Intern

IIIT D&M Kancheepuram

Oct. 2022 – May. 2023

Chennai, India

- Developed a Python parser to transform Verilog HDL into Virtual Reconfigurable Code (VRC).
- Enabled downstream simulation, synthesis, and formal verification in FPGA-style environments.

Data Science Intern

Indian Institute of Technology Kanpur

May 2022 – Oct. 2022

Kanpur, India

- Analyzed the publicly available HFEA dataset to estimate IVF treatment success rates. Identified key clinical factors influencing outcomes and built interpretable decision-support models.
- Uncovered data patterns and trends to inform patient-centric recommendations.

PUBLICATIONS AND PRESENTATIONS

Publication

[p1] Saxena, R., Nelavala, S. S., & Saxena, R. (2023). *MuscleDrive: A Proof of Concept Describing the Electromyographic Navigation of a Vehicle*. 1, 107–117.

Additional Posters and Defense Presentations

[p2] Stanley Sujith Nelavala, Yagna Manasa Boyapati, Harika Yarlagadda (2024). *Bulldog on Board*. Poster presented in CS 4995/5995: Mobile User Experience and Design Poster Session 2024, University of Minnesota Duluth, Spring 2024.

[p3] Nelavala, S. S., & Bhuiyan, M. M. (2024). *Investigating Multi-Modal Misinformation on Transgender and Non-Binary Issues on TikTok*. Poster presented at the CS Graduate Student Research Poster Session, University of Minnesota Duluth, February 28, 2024.

[p4] Nelavala, S. S. (2024). *Investigating Multi-Modal Misinformation on Transgender and Nonbinary Issues on TikTok*. Master’s Thesis Defense Presentation, University of Minnesota Duluth, August 15, 2024.

HONORS AND AWARDS

[h1] **UMD Computer Science Graduate Summer Research Fellowship**
University of Minnesota Duluth, Department of Computer Science Awarded: May 2025
Competitive fellowship supporting summer research for Plan A graduate students demonstrating strong thesis progress.

[h2] **UMD Computer Science Graduate Summer Research Fellowship**
University of Minnesota Duluth, Department of Computer Science Awarded: May 2024
Competitive fellowship supporting summer research for Plan A graduate students demonstrating strong thesis progress.

ACHIEVEMENTS AND WORKSHOPS

[a1] **National Supercomputing Mission – Computer Architecture Winter School**
Participated in an intensive national program focused on high-performance computing fundamentals, processor design, and modern computer architecture.

[a2] **Special Track Prize – Crowdhacks Hackathon**
Recognized for developing a movie recommendation system using cosine similarity–based ranking and retrieval techniques.

[a3] **30 Days of Google Cloud – Cloud Engineering Track**
Completed the full Track 1 Cloud Engineering pathway, covering core GCP services, compute workflows, and cloud deployment fundamentals.

PROFESSIONAL EXPERIENCE

Software Developer (<i>Remote</i>) <i>Mass Technologies</i>	Nov. 25 – present <i>Dayton, OH</i>
<ul style="list-style-type: none">Designing and maintaining backend services for a Hospital Systems ERP using Python, Flask/Django, and RESTful API integrations to support data exchange across clinical and administrative modules.Developing PostgreSQL database models, writing optimized queries, and collaborating with front-end developers and clinical teams to deliver reliable and user-centered system features.Improving system performance through structured debugging, code optimization, clear documentation, and active participation in Agile sprint cycles.	

SKILLS

Languages: Python, Java, C, C++, SQL, Dart, Swift, YAML
Cloud & DevOps: AWS (EC2, S3, RDS, Load Balancer, IAM, Route 53, API Gateway, Amplify), Docker, Git, GitHub
Software Development: Microservices (Spring Boot, Java), REST APIs, GraphQL, Agile Methodologies, SDLC (all phases), Unit Testing (JUnit), Swagger
Web & Mobile Development: React.js, Redux, Node.js, Flask, Bootstrap, Flutter, Android Studio, Xcode, Google APIs
Tools & Technologies: VS Code, IntelliJ, CLion, PyCharm, Eclipse, Figma, LaTeX, Pandas, Plotly, RStudio, Jira

Research Projects

- [1] **Investigating Multi-Modal Misinformation on Transgender and Non-Binary Issues** Aug. 23 – Aug. 25
 - Engineered a large-scale research infrastructure to study how misinformation targeting Transgender and Non-Binary communities circulates across TikTok, combining participant-provided browsing histories with automated scraping to construct a multimodal dataset spanning text, audio, and visual signals.
 - Analyzed cross-modal misinformation patterns by integrating GPU-based frame parsing, OCR-derived captions, metadata enrichment, and transformer-based topic modeling to uncover narrative tropes, high-impact creators, and pathways of amplification tied to user perception.
- [2] **ML Models for Estimation and Evaluation of IVF Success Rates** *Python, scikit-learn*
 - Processed and engineered a large-scale dataset of **800k+ HFEA IVF treatment records**, performing data cleaning, and multi-center normalization to build a reliable analytical dataset for clinical outcome prediction.
 - Developed interpretable machine learning models to estimate IVF success rates, identified key clinical predictors influencing outcomes, and uncovered data-driven patterns useful for patient-centric decision support.
- [3] **Python Parser for Verilog-to-Virtual Circuit Conversion** *Python, Verilog*
 - Developing a Python-based parser that converts standard Verilog circuits into a virtual reconfigurable architecture for simulation and logic testing.

Professional Projects

- [4] **Enterprise Asset Management Web Application** Nov. 25 - Present
 - Implementing scalable backend services with optimized PostgreSQL schemas and REST API integrations, enabling reliable coordination between clinical departments, administrative dashboards, and existing Mass Technologies ERP modules.

Personal Projects

- [5] **Fine-Tuning LLaMA-2 on a Telugu Instruction Dataset** *QLoRA, PEFT* Feb. 25 – Mar. 25
 - Developed a QLoRA-based fine-tuning pipeline for LLaMA-2-7B-Chat on a curated Telugu instruction dataset using Google Colab, incorporating efficient low-rank adaptation through Hugging Face's Transformers, PEFT.
 - Managed data preprocessing, tokenizer alignment, training workflows, and model merging, and deployed the finalized model to the Hugging Face Hub for public use and evaluation.
- [6] **MarketPulseRT – Real-Time Stock Market Data Pipeline** *Apache Kafka, Glue, Athena* Dec. 24 – Jan. 25
 - Developed a scalable real-time pipeline for streaming and processing stock market data using Kafka producers and consumers deployed on EC2, with ingestion routed to S3 and workflows managed through AWS Glue.
 - Enabled low-latency financial analytics by configuring Athena to perform SQL-based querying over continuously updated datasets, supporting real-time insights and large-scale market trend evaluation.
- [7] **Bulldog-On-Board: University Transition Assistance App** *Flutter, Figma, Firebase* Jan. 24 – May. 24
 - Built a Flutter-based mobile application to support incoming university students by centralizing campus resources, events, and onboarding workflows powered by Firebase authentication and cloud storage services.
 - Designed an intuitive and student-friendly UI in Figma, incorporating interactive campus maps, reminder features, and guided onboarding tips to improve navigation, engagement, and overall transition experience.
- [8] **Movie Recommendation System Using Cosine Similarity** *Python, Scrapy, Pandas*
 - Built a TF-IDF + cosine similarity engine for nearest-neighbor movie recommendations.
- [9] **Lane Recognition Using Digital Image Processing** *Python, NumPy, OpenCV*
 - Implemented lane detection using Canny edge detection, ROI filtering, and Hough transform.
- [10] **Object Identification Web Application** *Flask, Keras, scikit-learn*
 - Created a Flask-based inference system integrating a ResNet50 deep-learning model for object identification.

COURSEWORK

Master's Coursework

- [m1] Natural Language Processing
- [m2] Sensors and Internet of Things
- [m3] User Experience and Design
- [m4] Computer Networks
- [m5] Research Methodology
(Psychophysiology)

Bachelor's Coursework

- [b1] Programming and Data Structures
- [b2] Design and Analysis of Algorithms
- [b3] Operating Systems
- [b4] Computer Networks
- [b5] Computer Architecture
- [b6] Automata and Compiler Design
- [b7] Database Systems
- [b8] Digital Image Processing
- [b9] Embedded Systems
- [b10] Signals, Systems and Communications
- [b11] Probability Theory
- [b12] Linear Algebra
- [b13] Big Data / Analytics
- [b14] Designing Intelligent Systems

POSITIONS OF RESPONSIBILITY

- [1] **Graduate Student Representative & Graduate Program Council Student Member**,
GSA & Graduate Program Council — University of Minnesota Duluth Aug 2023 – Aug 2024
- [2] **Graduate Student Mentor**,
Department of Computer Science — University of Minnesota Duluth Aug 2024 – Aug 2025
- [3] **International Student Mentor**,
International Student Services — University of Minnesota Duluth Aug 2024 – Aug 2025
- [4] **Graduate Student Representative**,
South Asian Student Organization — University of Minnesota Duluth Aug 2024 – Aug 2025
- [5] **Placement Affairs Secretary**,
Placement and Training Office — IIITDM Kancheepuram Jul 2022 – May 2023
- [6] **Class Representative**,
COE 2019 Batch — IIITDM Kancheepuram Jan 2022 – May 2023
- [7] **Core Member**,
Institution Innovation Council (IIC) — IIITDM Kancheepuram Oct 2020 – May 2023
- [8] **Coordinator**,
Placement and Training Office — IIITDM Kancheepuram May 2021 – Jul 2022
- [9] **Core Team Member**,
IIITians Network Until May 2023
- [10] **Student Coordinator**,
The Media Club & Electronics Designers Club (EDC), IIITDM Kancheepuram Nov 2020 – Jul 2021

LICENSES AND CERTIFICATIONS

- [c1] **AWS Certified Solutions Architect – Associate**
Amazon Web Services (AWS) Issued: Feb 2025 Expires: Feb 2028
- [c2] **Reproducibility of Research Results (RCR)**
CITI Program Issued: Dec 2023 Credential ID: 59149024
- [c3] **Research Involving Human Subjects (RCR)**
CITI Program Issued: Dec 2023 Credential ID: 59149022
- [c4] **Research, Ethics, and Society (RCR)**
CITI Program Issued: Dec 2023 Credential ID: 59149023
- [c5] **RCR Agency Specific (Bundled Course)**
CITI Program Issued: Oct 2023 Credential ID: 58537651
- [c6] **RCR Core**
CITI Program Issued: Oct 2023 Credential ID: 59149021
- [c7] **Deep Learning - IIT Ropar**
NPTEL Online certification