Omkar Chekuri

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omkarchekuri

PhD in Computer Science
Data Science, Visualization, HCI, and Software Engineering

Professional Summary

- PhD in Computer Science with 6+ years of experience in visual analytics, visualization, and software engineering.
- Skilled in machine learning, deep learning, generative AI, statistical analysis, and mathematical optimization.
- Advanced proficiency in SAS for statistics, with Python and SQL for complex queries, database design, and automation.
- Proficient in building interactive web applications and data visualizations with front-end frameworks including React and Angular.
- Expert in developing interactive visual analytics tools, supported by usability studies and evaluation metrics.
- Published 3+ conference papers and presented work in visual analytics and deep learning for medical imaging.

Education

2019 – 2025 **PhD in Computer Science**, *University of Oklahoma*, Norman, OK, USA, *GPA: 3.48/4.0.*
Minor Field: Information Visualization and Visual Analytics; **Advisor:** Dr. Chris Weaver
Dissertation Title: *Augmenting Hierarchical Visualizations with Topology-Centric Representations and Interactions*

2016 – 2018 **M.S. in Data Science and Analytics**, *University of Oklahoma*, Norman, OK, USA, *GPA: 3.48/4.0.*

2008 – 2012 **Bachelor of Technology in Mechanical Engineering**, *JNTU*, Kakinada, India, *GPA: 3.35/4.0.*

Skills, Certifications, & Professional Affiliations

Affiliations	Association for Computing Machinery (ACM), Human Factors & Ergonomics Society (HFES OU)
Certifications	Tableau Designer(2020), Tableau Developer(2020), Advanced Google Analytics(2020),IBM-Generative AI and LLMs(2025), Machine Learning with Apache Spark (2025), Neo4j Certified Professional (Neo4j)
Programming	JavaScript, Python, Java, SAS, R, SQL, C#, GraphQL, Neo4j, C, CUDA
Libraries & Tools	Tableau, PowerBI, D3.js, Web-GL, Streamlit, Flask, Django, Vizard (VR), Improvise, LWJGL, MNE-Python, AdobeXD, AutoCAD, TensorFlow, Scikit-Learn, NLTK, React, Docker, Google Cloud, PowerApps, Hadoop, Linux
Technical Skills	Visualization, Visual Analytics, UI/UX Design, Prototyping, User Evaluation, Genetic Algorithms, Virtual Reality, Computer Graphics, Machine Learning, NLP, Generative AI, Database Management, EEG Data Analysis, FullStack Development, Distributed Systems, High Performance Computing, Big Data Analytics

Experience

06/2017 – 05/2025 **Multiple Research Assistant Roles**, *University of Oklahoma*, Norman, OK.

- **Python Course & Lab Instructor** (08/2021 – 05/2025) — Taught and Instructed Python Labs to 75+ students per semester for 8 semesters. Developed course and lab materials, supervised TAs, mentored students.
- **Power Platform Developer** (05/2023 – 08/2023) — Led development of a Microsoft 365 Effort Reporting System, automating workflows with Power Automate to reduce manual effort by 40%, saving $18K annually. Integrated SharePoint, PowerApps, and Power BI; managed stakeholder collaboration, training, and adoption.
- **Virtual Reality Developer** (05/2022 – 08/2022) — Built multi-user VR learning environments in Python, integrating biometric sensors (fNIRs, eye-tracking, haptics); managed full software lifecycle and usability testing.
- **Research Assistant – National Weather Service** (06/2021 – 08/2021) — Analyzed cross-agency discussions on severe weather response and produced concise reports that enhanced communication and research continuity.
- **Visual Analytics Researcher** (08/2019 – 05/2021) — Designed gesture-based interaction techniques for data exploration and developed a coordination library for D3.js visualizations handling 10,000+ data points across 30+ views.
- **Application Developer – Oklahoma Dept. of Transportation** (06/2018 – 12/2018) — Built web dispatch systems with ASP.NET Core, and SQL Server; implemented real-time APIs and responsive UIs using Blazor and Bootstrap.
- **Research Assistant – Academic Support** (06/2017 – 05/2018) — Supported faculty recruitment and helped secure over $150K in graduate student funding, contributing to departmental growth and student success.

01/2018 – 05/2018 **Data Analytics Intern**, *Cloud Nine Development LLC*, Norman, OK.

- Integrated Google Analytics with custom dashboards to enhance KPI tracking and boost forecast accuracy by 12%.
- Built a Flask–React platform with ARIMA models, automating insights and reducing manual reporting by 25%.
- Designed time-series forecasting pipelines, accelerating operational planning insights by 10–15%.
- Analyzed user behavior to identify UI inefficiencies; improved engagement by 22% via UX-driven redesign.

03/2013 – 02/2015 **CMMS Analyst – Python & SAS**, *Construction Development Company LLC*, Doha, Qatar.

- Automated SAP CMMS workflows with Python, SQL, and SASPy; improved reporting speed and reliability.
- Developed predictive models to analyze asset reliability, cutting unplanned outages by 15%.
- Built modular ETL systems integrating SAS macros and Python automation for accurate, efficient reporting.
- Created visual dashboards with Matplotlib, Plotly, and Dash for executive-level performance reviews.
- Led and supervised a team of CMMS engineers in on-site data collection, storage validation, and reporting activities.
- Acted as a liaison between clients and contractors, resolving technical and operational conflicts to ensure alignment, smooth execution, and timely delivery of maintenance and reporting objectives.

06/2012 – 12/2012 **Engineer – Reporting & Resource Analytics**, *SM Aker Management Solutions*, Kakinada, India.
- Automated logistics reporting using Python and Excel macros, reducing data entry time significantly.
- Digitized legacy operational logs, improving data quality and analytics readiness.
- Built frameworks for tracking offshore equipment and resources, enabling future predictive initiatives.
- Supported data extraction for senior analysts using SAS-based tools to streamline reporting cycles.

Selected Projects

2025 **Bidirectional Language Translation with a Transformer** – Developed a Transformer model for bidirectional translation between English and Sanskrit.The pipeline developed showcases best practices in MLOps, including a custom data loader for large files, containerization with Docker, and a CI pipeline with GitHub Actions.

2025 **Vision Transformer (ViT) using PEFT** – Developed a complete MLOps pipeline for training Vision Transformers on two separate tasks: CIFAR-10 classification and a multi-view classification with a Parameter-Efficient Fine-Tuning (PEFT) strategy.

2025 **GAN with FastAPI for Image generation** – Developed and deployed a complete end-to-end MLOps pipeline for a Generative Adversarial Network (GAN) using fastAPI. The project features a Generator model to create new handwritten digits and a Classifier model to predict the digit and confidence.

2024 **Hierarchical Visualization System** – Designed a visualization pipeline and software architecture featuring eight topology-enhanced techniques for representing and interacting with composite hierarchical data to support complex interactive operations. Evaluated the visualizations' ability to support effective representation and interaction.

2023 **Breast Cancer Prediction** – Aimed to enhance breast cancer detection by applying *Parameter-Efficient Transfer Learning (PETL)* to fine-tune a 328M foundation model, achieving 78.9% accuracy. Developed a smaller 36M *Vision Transformer (ViT)* model, which outperformed the larger model with 80.4% accuracy.

2022 **Resource Allocation Dashboard** – Developed an interactive *Streamlit* dashboard backed by complex *SQL queries* and *stored procedures* on *Snowflake*, enabling dynamic KPI tracking and data-driven resource planning.

2021 **Reinforcement Learning for Maze Solving** – Implemented *Q-Learning*, a *novel multi-agent SARSA* algorithm from scratch, improving pathfinding speed by over 17% for dynamically generated mazes.

2021 **Distributed Systems** – Engineered a distributed Sudoku solver leveraging *Docker containers* for scalable, independent services. Implemented robust inter-process communication (IPC) with *encrypted channels* and *Round Robin load balancing* across worker nodes, ensuring system redundancy, high availability, and efficient task distribution.

2020 **Game Development** – Developed a 2.5D platformer game incorporating animation, collision detection, shaders, particle systems, and basic physics, applying a *Milestone-Driven approach* and *Test Driven Development* to *software development* to gain proficiency in advanced computer graphics techniques.

Publications & Presentations

2024 **Chen, X., Chekuri, Omkar**, "David vs. Goliath: Large foundation models are not outperforming small models in multi-view mammogram breast cancer prediction", SPIE Medical Imaging, 2024. Secured **Second Place** in Computer-Aided Diagnosis category ***Best Paper Award.***

2025 **Chekuri, Omkar, Weaver, C.**, "C4D3: A View-Level Abstraction and Coordination Library for Building Coordinated Multiple Views with D3". In Proc of the 20th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - IVAPP

2025 **Chekuri, Omkar, Weaver, C.**, "A Model of Representational Suitability of Tree Visualizations". (In Revision)

2025 **Chekuri, Omkar, Weaver, C.**, "Towards Explicitly Representing Topologies in Tree Visualizations". (In Review)

2022 **Chekuri, Omkar, Weaver, C.**, "An Investigation into the Representational Suitability of Tree Visualizations", ***Poster Presentation***, IEEE VIS 2022.

Leadership, Volunteering & Service

2023-2025 **Conference Reviewer** for the IEEE Visualization and conference.

2022-2025 **Mentored** four Master's students and one junior PhD student on curriculum and career planning.

2022 **Student Volunteer** for IEEE VIS 2022 conference, providing technical support and helping organize sessions.

Key Achievements

2024 **Best Paper Award - Second Place** in Computer-Aided Diagnosis category, SPIE Medical Imaging

2023 **State of Outreach Innovation Award** — Designer and Developer of the "Effort Reporting System".

2023 **Richard L. O'Shields Engineering Scholarship** — Awarded for academic excellence.

2022 **CS Alumni Graduate Fellowship** — Recognized for outstanding research contributions.

2018 **PhD Recruitment Excellence Fellowship** — Recognized for academic excellence as a new PhD student.