Omkar Chekuri

PhD Candidate in Computer Science | Data Science and Visual Analytics

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Summary

- PhD candidate specializing in information visualization software architectures with 5+ years of experience.
- Strong foundation in data science, AI, and machine learning, with a focus on solving real-world challenges.
- Experienced in publishing research, developing innovative visualization solutions, and software development.
- Skilled in evaluating user interfaces and conducting user studies to enhance data-driven decision-making.
- Interested in applying visual analytics to emerging technologies like Digital Twins and Virtual Reality.

Education

2018 – Dec-2024 (Expected) **PhD in Computer Science**, *University of Oklahoma*, Norman, OK, *GPA: 3.50/4.0.*
Minor Field: Information Visualization and Visual Analytics
Advisor: Dr. Chris Weaver
Dissertation Title: *Designing Visualization Software Architectures for Visualization of, and Interation with Hierarchical Topologies to Support Operations on Hierarchical Data*

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

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

Skills & Certifications

Certifications	Tableau Designer(2020), Tableau Developer(2020), Advanced Google Analytics(2020)
Programming	JavaScript, Python, Java, R, SQL, C#, C, Linux
Libraries & Tools	React, Node, Docker, TensorFlow, Scikit-Learn, NLTK, Improvise, D3.js, Web-GL, Streamlit, Vizard(VR), LWJGL, Tableau, PowerBI, PowerApps, Google Cloud, AdobeXD, AutoCAD, CATIA
Technical Skills	Visualization, Visual Analytics, UI/UX Design, Prototyping, User Evaluation, Virtual Reality, Computer Graphics, Machine Learning, NLP, Generative AI, Mechanical Engineering, SAP CMMS, fMRI, EEG
Soft Skills	Project Management, Team Management, Client Communication & Stakeholder Management,
Languages	English(Fluent), Telugu(Native), Hindi(Limited Working Proficiency)

Experience

08/2018 – 12/2022 **Graduate Research Assistant(Various)**, *University of Oklahoma*, Norman, OK.
- Developed a high-performance JavaScript abstraction and coordination **library** for D3.js, enabling seamless interaction across up to 30 synchronized visualizations with 10000 total data points without performance degradation.
- Developed a representative suitability **model** to assesss the capability of various hierarchical visualizations in their ability to represent various kinds of information.
- Developed a Tree Visualization system, **software architecture** and a **data pipeline**, designed eight tree visualizaiton designs to support operations on various relations in hierarchical visualizaitons.
- Developed Immersive **Virtual Reality** environments integrated with fNIRs, eye-tracking, and haptic devices for developing non text based smart learning environments.
- Designed gesture-based interactions to facilitate direct manipulation of visual interfaces for data entry.
- Designed and developed an Effort Reporting System, driving significant cost savings, improved functionality and streamlining deployment process, resulting in enhanced efficiency and alignment with existing workflows.
- Supported researchers and forecasters at *NOAA - National Severe Storms Laboratory* by summarizing key findings from meetings, facilitating effective communication and informed decision-making in severe weather research.
- Supported the Department of Biomedical Engineering in faculty recruitment efforts and managed the creation of social media flyers and organized department events.

2021 – Present **Teaching Assistant**, *University of Oklahoma*, Norman, OK.
- Instructed Python programming course for 70 students and supervised other teaching assistants.
- Developed course material and Instructed lab sessions on an average of 75 students per semester for 6 semesters, improving student performance through practical, hands-on instruction.

01/2018 – 05/2018 **Data Analytics Intern**, *Cloud Nine Development LLC*, Norman, OK.
- Developed custom **analytics dashboards** using Google Analytics, improving KPI forecasting accuracy by 10%.
- Implemented time series models to automate business metric predictions, leading to more effective business decision-making.

01/2013 – 02/2015 **SAP CMMS Engineer**, *Construction Development Company LLC*, Doha, Qatar.
- Coordinated asset tracking and data management for EPIC (Engineering, Procurement, Installation, Commissioning) oil & gas, and construction projects, streamlining reporting and reducing data handling time by 30%.
- Concurrently managed 5 client projects across various roles, demonstrating strong communication skills by actively participating in regular project meetings to coordinate between vendors and resolve any issues, ensuring seamless collaboration and continuous project progress.

06/2012 – 12/2012 **Mechanical Engineer**, *Aker Solutions*, Kakinada, India.
- Conducted visual inspection and prepared detailed Material & Logistics reports to support project timelines.
- Managed and maintained safety check records, ensuring compliance with industry standards through regular inspections.

Selected Projects

2024 **Usability and User Experience Study** – Designed protocols, created user-centered visualizations, and conducted utility and usability testing of interactive hierarchical visualizations for data analysis, focusing on improving user experience (UX), task efficiency, and interface accessibility.

2023 **AI-Based Breast Cancer Prediction System** – Contributed to an award-winning research project using machine learning to predict breast cancer from mammogram images, earning second place at the SPIE Medical Imaging conference.

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

2021 **Distributed Systems** – Developed a Docker-based distributed Sudoku solver utilizing secure communication through public key encryption and a Round Robin scheduling algorithm for token allocation, ensuring system redundancy and seamless client-server interaction.

2020 **Game Development** – Developed a 2.5D platformer game incorporating animation, collision detection, shaders, particle systems, and basic physics, applying a milestone-driven approach to software engineering, and enhancing proficiency in advanced computer graphics techniques.

2017 **User Interface Evaluation of Online Commercials** – Conducted an eye-tracking experiment to analyze user behavior and eye movement, focusing on the impact of skip functionality for YouTube commercials through statistical and qualitative analysis.

Publications

2024(Revision) **Chekuri, Omkar, Weaver, C.**, "C4D3: View-level Abstraction for Building Coordinated Multiple Views".

2024(Revision) **Chekuri, Omkar, Weaver, C.**, "A Model of Representational Suitability of Tree Visualizations".

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. Second Place in Computer-Aided Diagnosis Best Paper Award.

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

Key Achievements

2024 **Best Paper Award** - Second Place in Computer-Aided Diagnosis Best Paper, 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 demonstrating academic excellence as an incoming PhD student.

Leadership, Volunteering & Service

Volunteer **IEEE VIS Conference**-Assisted in organizing the IEEE VIS 2022 international conference.

Reviewer **IEEE VIS, EuroVis** - Reviewed research papers in international visualization conferences.

Mentor Advised Master's and Undergraduate students on curriculum, projects, and career planning.

ROTC Cadet Led community events like blood drives and charity marathons, raising awareness for veterans.

Grad Student Community Advocated for representation, inclusivity, and funding support for graduate students as a graduate student community member.