Omkar Chekuri

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Visualization and Visual Analytics Researcher
Software Engineering, Data Science, UI/UX

Summary

- PhD candidate specializing in information visualization software architectures with over **5 years** of experience.
- Skilled in evaluating user interfaces and conducting user studies to enhance data-driven decision-making.
- Strong foundation in data science, AI, and machine learning, with a focus on solving real-world challenges.
- Experienced in publishing research, developing visualization solutions, and software development.
- Over **10 years** of experience in data collection, analysis, and reporting across the Construction, Oil & Gas, and IT sectors.
- Experienced in project management, team management, client communication, and stakeholder management.
- Interested in leveraging visual analytics, data science, and usability evaluation skills to enhance the adoption of emerging technologies such as Virtual Reality, Brain-Computer Interfaces, and the Internet of Things.

Education

2018 – Feb-2025 (Expected) **PhD in Computer Science**, *University of Oklahoma*, Norman, OK, USA, *GPA: 3.5/4.0.*
Minor Field: Information Visualization and Visual Analytics
Advisor: Dr. Chris Weaver
Dissertation Title: *Designing a Software Architecture and Data Pipeline for the Visualization and Interaction with Hierarchical Topologies to Support Analytical Operations on Hierarchical Visualizations*

2016 – 2018 **M.S. in Data Science and Analytics**, *University of Oklahoma*, Norman, OK, USA, *GPA: 3.5/4.0.*

2008 – 2012 **Bachelor of Technology in Mechanical Engineering**, *JNTU*, Kakinada, India, *GPA: 3.3/4.0.*

Professional Affiliations

Association for Computing Machinery (ACM) *Human Factors & Ergonomics Society (HFES OU)*

Skills & Certifications

Certifications	Tableau Designer(2020), Tableau Developer(2020), Advanced Google Analytics(2020)
Programming	JavaScript, Python, Java, R, SQL, C#, ArangoDB, GraphQL, Neo4j, C, CUDA
Libraries & Tools	Tableau, PowerBI, D3.js, Web-GL, Streamlit, Django, Vizard (VR), Improvise, LWJGL, MNE-Python, AdobeXD, Figma, AutoCAD, TensorFlow, Scikit-Learn, NLTK, React, Docker, Kubernetes, Google Cloud, PowerApps, Linux
Technical Skills	Visualization, Visual Analytics, UI/UX Design, Human-Computer Interaction, Prototyping, User Evaluation, OPtimization, Virtual Reality, Computer Graphics, Machine Learning, NLP, AI, Database Management, Neuroimaging data analysis, Frontend UI Frameworks, Distributed Systems, High Performance Computing, Big Data Analytics
Other	Proficient in interpreting and modifying P& ID, Electrical, HVAC, Telecom, Fire & Safety and Civil Drawings

Experience

08/2018 – 12/2022 **Graduate Research Assistant(Various)**, *University of Oklahoma*, Norman, OK.
- Developed a high-performance abstraction and **coordination library** for D3.js in TypeScript, enabling seamless interaction across up to 30 synchronized visualizations with 10000 total data points without performance degradation.
- Developed a **representative suitability model** to assess 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 novel tree visualization designs to support operations on various relations in hierarchical visualizations.
- Developed software and **Multi-Person VR** environments integrated with **fNIRs, eye-tracking, and haptic devices**, to enhance non-text-based smart learning experiences. This included creating training materials, developing user interface.
- Designed **gesture-based interactions** to facilitate **direct manipulation** of visual interfaces for data entry.
- Designed, developed and evaluated **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 on severe weather research.

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.
- Analyzed business needs and developed custom Google Analytics dashboards to identify key performance indicators (KPIs) and UI bottlenecks in the application, offering recommendations for improvements and actionable insights.
- Developed time series models and created an interactive R-Studio dashboard to automate monthly and yearly users forecasting to aid in business decisions.

01/2013 – 02/2015 **SAP CMMS Engineer**, *Construction Development Company LLC*, Doha, Qatar.
- Managed asset tracking, data collection, cleaning, and management for EPIC(Engineering, Procurement, Installation, Commissioning) projects, streamlining **reporting processes** and reducing data handling time by 30%.
- Managed 5 client projects across various roles, showcasing strong communication by coordinating with vendors and resolving issues during regular meetings to ensure smooth collaboration and continuous progress.

06/2012 – 12/2012 **Mechanical Engineer**, *Aker Solutions*, Kakinada, India.
- Conducted visual inspections and prepared detailed **Material & Logistics reports** to allocate resources efficiently.
- Maintained safety check records, ensuring compliance with industry standards through regular inspections.

Selected Projects

2023 **Tree Visualization System** – Developed a tree visualization system, designed protocols, and conducted a usability and utility study using both qualitative and quantitative methods, focusing on supporting operations on tree data.

2023 **Effort Report System** – Collaborated with stakeholders to gather requirements, iterated on Figma sketches, and developed the app using Microsoft Power Platform. Conducted expert reviews, refined designs from feedback, and deployed the app to improve reporting efficiency, reduce costs, ensure ease of use and maintainability.

2022 **Full Stack graph visualization** – Developed a family hierarchy visualization using ArangoDB, Django, React, and D3.js, for representing hierarchical data and identifying relationships through interactive visualizations.

2022 **Frontend Reporting Dashboard** – Built a reporting dashboard using ***Streamlit*** with data from a ***Snowflake*** database to display key performance indicators, driving data-driven decisions.

2022 **C4D3: View-level Abstraction and Coordination Library** – Developed a view-level abstraction library for building coordinated multiple-view visualizations using D3.js, supporting declarative coordination specification.

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

2021 **Distributed Systems** – Developed a distributed Sudoku solver with multiple clients, implementing secure client-server communication using public key encryption and employing Round Robin scheduling to distribute tasks. Deployed the application in a Dockerized container on Google Cloud for scalability and efficiency.

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.

2017 **Evaluation of Commercials** – Conducted an ***eye-tracking*** experiment to analyze user behavior and assess the impact of skip functionality on YouTube commercials to inform more effective marketing strategies.

Publications & Presentations

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

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

2024 (Peer-Review) **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.

2022 (Presentation) **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 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.

Leadership, Volunteering & Service

2023-Present **Conference Reviewer** for the IEEE VIS and EuroVis conferences.

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

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

2018-2019 **Graduate Student Community Member**, advocated for representation and inclusivity for graduate students.

2016-2017 **ROTC Cadet**, led community events such as blood drives and charity marathons, raising awareness for veterans.

References

References available on request.