Sindhuja Madabushi

Ph.D Virginia Tech, Blacksburg, USA

✉ msindhuja@vt.edu　　　☎ (505) 457-7721　　　✛ https://sindhujamadabushi.github.io

SKILLS

Programming: Python, C#, Java, SQL, JavaScript
ML & Data: PyTorch, TensorFlow, scikit-learn, NumPy, Pandas, Matplotlib
Databases: Neo4j, MongoDB, Cassandra, Redis, MySQL
Tools: Linux, Git, MPI, Cluster computing, Jupyter
Web & Visualization: HTML5/CSS3, Bootstrap, d3.js, Dimple.js, Gephi, SharePoint

INDUSTRY EXPERIENCE

Research Associate

University of Wisconsin-Madison Department of Electrical & Computer Engineering   Jan 2020 - Dec 2022

Engineered a scalable two-cloud algorithm for privacy-preserving DNA read alignment, capable of processing the entire human genome and massive volumes of next-generation sequencing data. **Delivered 100 % privacy with zero loss in accuracy**, achieving alignment for a single chromosome in just minutes.

Student Research Intern

PiSA sales GmbH   Sept 2017 - Oct 2018

Designed and integrated a modular sales data visualization framework featuring heat maps, bubble graphs, Venn diagrams using D3.js. Embedded within a TypeScript-based graphical dashboard, the system supported multi-dimensional data exploration and enabled **quantitative analysis of customer behavior patterns**, leading to the identification of **previously unobserved correlations** in purchase trends.

Software Engineer 1

Innominds Software   Oct 2015 - Jun 2016

Designed and implemented core components of an interactive client dashboard for BenchmarkONE, incorporating chatbots, adaptive icons, content management tools, and novel progress visualization techniques. Conducted **user experience experiments** to evaluate interface usability and engagement, leading to **measurable improvements in task completion rates and customer satisfaction scores**.

Systems Engineer

Tata Consultancy Services   Aug 2013 - Sept 2015

Architected and deployed a cloud-native enterprise communication system enabling secure, high-availability dissemination of organizational announcements and multimedia content. Integrated advanced search, role-based access control, and real-time analytics to **optimize information retrieval and measure engagement trends**. System design principles were validated through load-testing and user behavior analysis, demonstrating scalability to tens of thousands of concurrent users with sub-second response times.

EDUCATION

PhD Candidate	**Master of Science**	**Bachelor of Technology**
Computer Science	Data and Knowledge Engineering	Computer Science
Virginia Tech (Aug 2023 - Present)	OVGU Magdeburg (Oct 2016 - Mar 2019)	GITAM University (Aug 2009 - May 2013)

SELECTED PUBLICATIONS

OPUS-VFL: Incentivizing Optimal Privacy-Utility Tradeoffs in Vertical Federated Learning
Sindhuja Madabushi, Ahmad Faraz Khan, Haider Ali, Jin-Hee Cho (ArXiv 2025)

Empirical Analysis of Privacy-Fairness-Accuracy Trade-offs in Federated Learning: A Step Towards Responsible AI
Dawood Wasif, Dian Chen, Sindhuja Madabushi, Nithin Alluru, Terrence J Moore, Jin-Hee Cho (AIES 2025)

Two-Cloud Private Read Alignment to a Public Reference Genome
Sindhuja Madabushi, Parameswaran Ramanathan (PETS 2023)

AWARDS AND SERVICE

Best Poster Award: Commonwealth Cyber Initiative Southwest Virginia Student Researcher Showcase, 2025
Recognized for excellence in presenting original research in privacy-preserving federated learning.

Elected Secretary: Computer Science Graduate Council, Virginia Tech, 2025–2026
Chosen by peers to represent the graduate student body, coordinate departmental initiatives, and advocate for student interests.

Volunteer, C-Tech^2 Program: Virginia Tech, Summer 2025
Delivered STEM outreach workshops for high school students, introducing optimization concepts and problem-solving activities.

Travel Awards: ACM Capital Region Celebration of Women in Computing (CAPWIC) 2024 & 2025; Conferenceship Travel Award, Annual Computer Security Applications Conference (ACSAC) 2023.

Volunteer, STEM Santa Fe: Nonprofit organization that delivers STEM programs, mentoring, and resources
Led a mentoring team for ~100 school students, inspiring participants to explore STEM careers.

Master's Mentor: Otto-von-Guericke University, 2017–2018
Organized orientation events and provided mentorship to over 100 incoming international graduate students.

Organizer: Magdeburg Indians, 2017–2018.
Directed the cultural team for community events, including a summer festival with ~1,000 attendees.