

**Dr. Rajiv Ramnath**  
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**Summary:**

- 35+ years' experience in computing research and development, education, and service.
- \$46M+ in research awards; \$14M+ in expenditures.
- Leadership team experience on a wide range of institute and center initiatives – the ICICLE NSF AI Institute, the 5G-Ohio Connectivity Center, the Translational Data Analytics Institute, and the Institute for Sensing Systems. Advisory board member Software Gateways Community Institute and Software Gateways Center of Excellence.
- 3+ years' experience as a Program Director at the National Science Foundation, directing federal research programs, managing and co-managing five programs, \$140M in ongoing awards, providing program oversight on large-scale institutes and centers. Continued service to large-scale, cross-disciplinary project reviews and NSF proposal panels.
- 20+ years' experience in building and leading an industry-university collaborative program that integrates applied research in large-scale systems into technology-transfer, professional practice, software engineering education, innovation, and entrepreneurship education.
- 12 years' industry experience in global software product development and deployment of enterprise-level technology, work-management systems, Internet and Web-based, E-commerce and distributed information systems, and research and development of advanced software technologies. This includes:
  - 11 years' experience in delivering on inter-company software projects and customer deployments with globally located software teams and partner organizations.
  - 11 years' experience leading federally and commercially funded, advanced technology application R&D projects.
  - 35+ years of management and software development consulting experience in information technology.
  - Experience in developing executive education workshops and industry talks.
- 140 peer-reviewed publications (25 in journals, 115 in conferences), 4 best paper awards, 3 books, 8 book chapters.
- 16 PhD dissertations, 2 MFA theses, 71 MS theses, 111 MS projects and 5 senior honors theses, advised and co-advised.
- 24+ years' experience in software engineering education. Developed and established 7 courses in Computer Science and Engineering - a research-intensive Capstone course that provided integrated research experiences for all levels of students and a 6 course “professional spine” within the computer science program at OSU. These courses are among the most widely taken courses in the curriculum; the Computer Science and Engineering Capstone program – the program is one of the largest computing-oriented programs in the country.
- Helped launch and manage the NSF NEWPATH Entrepreneurship program for Engineering students. Over 100 students “graduated” from this program, with 4 businesses being started.
- 1 national teaching award, 2 Ohio State University teaching awards.
- Service to Computer Science and Engineering faculty search, graduate admissions, graduate studies, outreach and engagement, promotion and tenure committees, College of Arts and Sciences and the Sustainability Institute Sustainability Education and

Learning Committee Graduate and Professional Subcommittee, College of Engineering promotion and tenure committees, College of Engineering Research Council, Dean's Advisory Committee, University Senate, and Senate Research Subcommittee.

- Doctorate in Computer Science, specialization in Programming Environments for Distributed Systems.

### **Federal Agency Experience and Employment History:**

- January 2015 – September 2018. Program Director, National Science Foundation, Office of Advanced Cyberinfrastructure (OAC), Software Cluster. Part-time appointment (20%) from January 2018 onwards.

Managed a portfolio of \$140M in awards in the following programs:

- Software Infrastructure for Sustained Innovation (SI2), see: <https://www.nsf.gov/pubs/2016/nsfl6532/nsfl6532.htm>.
- Exploiting Parallelism and Scalability (XPS), see: <https://www.nsf.gov/pubs/2016/nsfl6507/nsfl6507.htm>.
- Scalable Parallelism at the eXtreme (SPX), see: <https://www.nsf.gov/pubs/2016/nsfl6605/nsfl6605.htm>.
- Critical, Resilient, Interdependent, Systems and Processes (CRISP), see: <https://www.nsf.gov/pubs/2016/nsfl6519/nsfl6519.htm>.
- Designing Materials to Revolutionize and Engineer our Future (DMREF), see: <https://www.nsf.gov/pubs/2016/nsfl6613/nsfl6613.htm>.

Provided program oversight to the following large awards (\$15M-\$23M):

- The Science Gateway Community Institute (sciencegateways.org)
- The Molecular Sciences Software Institute (molssi.org)
- The Network for Computational Nano Technology (nanoHub.org)
- September 2014 – January 2015. Expert, National Science Foundation, Advanced Cyberinfrastructure (ACI) Program.

### **Academic Experience and Employment History:**

- September 2016 – present: Professor of Practice, Dept. of Computer Science and Engineering, The Ohio State University.
- January 2022 - present: Co-PI, State of Ohio Broadband and 5G Sector Partnership project.
  - Member of core team, leading multiple programmatic initiatives.
- September 2021 – present: Member, Leadership and Management Team, NSF Institute for Intelligent Cyberinfrastructure with Computational Learning in the Environment (ICICLE) <https://icicle.osu.edu/>
  - Investigator on several research thrusts, leading development of the ICICLE reference architecture, contributing to workforce development, broadening participation and collaboration and knowledge transfer.
- January 2020 – August 2023: Co-Director, Smart and Connected Communities and Distributed Sensing Community of Practice, Translational Data Analytics Institute (TDAI), The Ohio State University.
  - Member of the TDAI leadership team.
- September 2002 – present: Co-Director, Collaborative for Enterprise Transformation and Innovation (CETI, <http://www.ceti.cse.ohio-state.edu>), Dept. of Computer Science and Engineering, The Ohio State University (OSU), Columbus, Ohio.

- Established industry-university collaborative programs and partnerships in IT enabled services with the National Science Foundation and Ohio-located companies. Developed interdisciplinary research collaborations with the Departments of Industrial and Systems Engineering, Education, Sociology, and Design, the John Glenn School of Public Affairs, Dept. of The OSU Office of Information Technology, the OSU Medical Center, Dept. of Accounting and MIS and the Center for Entrepreneurship.
- Established strategic partnerships with local industry through CETI as an Industry-University Collaborative Research Center (IUCRC) Site affiliated with the Georgia Institute of Technology Center for Experimental Research in Computing (CERCS). The CETI IUCRC was in existence from 2008-2013.
- CETI interactions resulted in JP Morgan Chase and Nationwide Insurance becoming one of the largest recruiters of CSE graduates.
- Generated \$5.1M in external funding for CETI, out of \$12.1M in total external funding.
- Directed over 100 industry-university collaborative projects with local industry partners (Nationwide Insurance, SafeAuto, State Auto, City of Columbus, JPM Chase, McGraw-Hill Companies, the Ohio Department of Job and Family Services, Astute Technologies, Rosetta Inc., IBM, The Columbus Dispatch, OCLC and others). These projects delivered strategic value to local industry, contributed to best practices in information technology management, IT strategic planning, technology selection, Service-Oriented Architecture and Enterprise Architecture, and delivered advanced educational experiences to graduate, undergraduate and K-12 students.
- Managed the DARPA-funded, OSU-led multi-industry-university ExScal project that deployed the largest wireless sensor and 802.11 long-line intrusion detection networks at the Avon Park Air Force base in Florida.
- Established the CETI CIO Forum on Enterprise Architecture to enable peer-based learning among local industry on EA roles, governance, EA-tailored innovation, SOA, enterprise knowledge management, the impact of the Sarbanes-Oxley Act on EA, EA and acquisitions and Agile Practices in EA.
- Developed workshop-based offerings for local area professionals in Enterprise Architecture, Enterprise Software Engineering, Product Management, Software Quality Assurance, Software Testing, Agile Methodologies and Innovation.
- October 2013 – December 2014 AweSIM Evangelist, Ohio Supercomputer Center, OH-Tech. The AweSIM initiative (<http://www.awesim.org>) is an initiative funded by the 3<sup>rd</sup> Frontier Program of the State of Ohio. AweSIM seeks to use modelling and simulation supported by high-performance computing to bring a sustainable competitive advantage to small and medium manufacturers. In the Evangelist role, I supported and advised business development, software architecture and training and workforce development.
- September 2008 – September 2012: Associate Director, Institute for Sensing Systems, College of Engineering (<http://www.iss.osu.edu>), The Ohio State University. Charged with fiscal management of the Institute, developing industry affiliate program and engineering curriculum around integrated sensing, establishing inter-disciplinary initiatives, leading grant proposals, and project and program management. This Institute currently serves as an umbrella organization for \$37M in on-going grant funding. Duties involve strategic planning, financial planning, implementing and evaluating initiatives (e.g. industrial advisory board, orchestrating integrative projects, and educational and

multiple levels of community involvement efforts), guiding research proposal development, implementing seed initiatives, marketing, and day-to-day operational management.

- September 2010 – August 2016: Associate Professor of Practice, Dept. of Computer Science and Engineering, The Ohio State University.
  - As part of the Dean's committee for establishing the Masters' of Engineering Leadership degree program, developed the Enterprise Architecture and Systems track (in collaboration with CETI member companies).
  - Enhanced the software engineering course to include enterprise-relevant components – enterprise technologies, software and system architecture, integration patterns, risk management and business-IT alignment.
  - Developed an advanced course on mobile computing.
  - In collaboration with Syracuse University and JP Morgan Chase incorporated the Global Enterprise Technologies (GET) program (<http://globaltech.syr.edu/>) into the Computer Science and Engineering program at OSU.
  - Developing a certificate program on the Foundations of Software Development offered by the Computer Science and Engineering department to Nationwide Insurance. 52 students successfully completed this program.
  - Courtesy appointment in Electrical and Computer Engineering.
  - Member University Ad- Hoc committee on Faculty Rewards.
- September 2007 – September 2010: Assistant Professor of Practice, Dept. of Computer Science and Engineering, The Ohio State University.
  - Helped found, develop and direct the NSF-funded NEWPATH entrepreneurship program for students in the College of Engineering and College of Business at the Ohio State University.
  - Redeveloped the Distributed Enterprise Computing course to include project-based modules on XML, AJAX, the Google toolkit, Enterprise Java (including Enterprise Java Beans, Java Server Faces) and the Enterprise Service Bus.
  - Established and expanded the Computer Science and Engineering Capstone Program through industry-sponsored projects with large industry and government organizations, non-profit agencies and technology entrepreneurs. This Capstone program is extremely well regarded and the most popular segments within the Computer Science and Engineering curriculum. So far, 200+ projects have been completed. Several projects result in software incorporated in products or in applications or commercial use. This course plays a key role in the ABET accreditation of the CSE program.
- July 2007 – September 2007: Senior Lecturer, Dept. of Computer Science and Engineering, The Ohio State University (bridge appointment). Duties overlapped with the above professor of practice appointments.
- September 2002 – June 2007: Visiting Assistant Professor, Dept. of Computer Science and Engineering, The Ohio State University.
  - Established CETI (see above) and began engagement with industry. Taught the junior keystone project course and the senior Software Engineering Capstone course.
- 1999-2002: Senior Lecturer (adjunct faculty), Department of Computer and Information Science, The Ohio State University. Taught the Software Engineering Capstone course.

### **Industry Experience and Employment History**

- April 1998 – June 2002: Vice President, Cententus Technology Corp., Officer of the company. Technical and managerial responsibility over the development and competitive positioning of the Cententus line of work-management products. Established and integrated offshore teams in Bangalore, India, Pune, India and Toronto, Canada. This workflow technology enabled CTC to receive \$6M in venture capital funding.
- December 1999 – June 2000, interim Chief Technology Officer, Cententus Technology Corp., responsible for setting enterprise technology direction for Cententus product suite.
- May 1997 - June 2002: Director, Product Development, Cententus Technology Corp.<sup>1</sup>, Complete technical responsibility over global product development. Managerial responsibility over Cententus' US-based team, including project management, team structure and responsibilities, hiring, and salary structure, personnel management, review and development. Chief Architect of the Cententus suite of workflow products. Led engagements on Cententus workflow deployments at Lockheed-Martin, Caterpillar Inc., Boeing (Rocketdyne division), MCI-WorldCom (and others). Internal project manager for the Solutions for MES-Adaptable Replicable Technology (SMART) project of the National Information Infrastructure Integration Protocols (NIIP) consortium. The goal of this IBM-led, multi-company Government ATP-funded R&D project was to showcase the use of advanced technologies (Work-management, Business Rules, Intelligent Agents, ERP) in solving virtual enterprise (VE) problems spanning the engineering and manufacturing domains. Also developed a lightweight XML-based WfMC standards-compliant in-memory workflow engine that became one of the key deliverables of the SMART project.
- September 1989 - May 1997: Senior Systems Analyst, Knowledge Integration Center, Cententus Technology Corp. (formerly UES Inc.). Played various software development roles, including team lead on several projects.

#### **Consulting Experience and History:**

- Product development, software architecture and project management services: For a local e-commerce company providing kiosk-based e-commerce products to the underserved and unbanked market.
- Advisory Board Member services: For a local high-technology software startup specializing in augmented-reality products for the retail market.
- Advisory Board Member services: For a local high-technology software startup that provides information security services.
- Software architect services: For a local software consulting company, helped design the architecture of an engineer's workbench for the US Air Force.
- Software engineering services: For a local high-volume law firm, helped develop the architecture for their custom ERP application, provided IV&V services during development and evaluated talent to staff their application development and their IT operations.
- Advanced technology evaluation services: For an international steel processing company, evaluated the value of RFID technology.
- Expertise evaluation services: In support of H-1 and Permanent Residency applications to the Immigration and Naturalization Services.

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<sup>1</sup> Until April 1998 Cententus Technology Corp. was a wholly-owned subsidiary of ComputerVision Inc., Boston, Massachusetts.

- Expert witness services: For (a) an international parcel and package delivery company, (b) a talent management, leadership development, and sales improvement corporation providing personnel assessment and research services, (c) a state university and (d) a building temperature monitoring company.

**Professional Expertise and Interests:**

- Knowledge-based systems, image analysis, machine-learning and its applications.
- Global enterprise system and software development, enterprise architecture, enterprise technologies, enterprise software engineering, model-driven integration environments for service-oriented architectures, object-oriented software development and methodologies. and computer science education.
- Wireless sensor network, mobile and pervasive computing applications in the enterprise, smart and connected environments.
- Alignment of business strategy, innovation and processes with information technology.
- E-Government, cyber-infrastructures, collaborative environments, configurable enterprise systems, workflow and work-management systems, information modeling, enterprise rules, intelligent agent, MES and ERP systems.
- Standards development in workflow, product data management and enterprise resource planning.
- Innovation and entrepreneurship.

**Academic Qualifications:**

- Ph.D., Computer and Information Science, The Ohio State University, September 1988.
- M.S., Computer and Information Science, The Ohio State University, August 1983.
- Bachelor of Technology, Electrical Engineering, Indian Institute of Technology, New Delhi, India, 1981.

**Journal Publications:**

1. “Creating intelligent cyberinfrastructure for democratizing AI.” Panda, D. K., V. Chaudhary, E. Fosler-Lussier, R. Machiraju, A. Majumdar, B. Plale, R. Ramnath, P. Sadayappan, N. Savardekar, and K. Tomko. 2024. AI Magazine 1–7. <https://doi.org/10.1002/aaai.12166>.
2. “Context-Aware Driver Risk Prediction with Telematics Data”, Sobhan Moosavi, Rajiv Ramnath, Accident Analysis and Prevention, Elsevier Publications, ScienceDirect, Volume 192, 107269, ISSN 0001-4575, <https://doi.org/10.1016/j.aap.2023.107269>, 2023.
3. “Using Deep Learning for Automated Identification of Cone and Rod Photoreceptors from Adaptive Optics Imaging of the Human Retina”, Mengxi Zhou, Tianyu Jin, Chenwei Xu, Nathan Doble, Stacey Choi, Srinu Parthasarathy, Rajiv Ramnath, Biomedical Optics Express, 13(10), 5082-5097, 2022.
4. “Predicting airborne pollutant concentrations and events in a commercial building using low-cost pollutant sensors and machine learning: A case study”, Ahmad Mohammadshirazi, Vahid Ahmadi Kalkhorani, Joseph Humes, Benjamin Speno, Juliette Rike, Rajiv Ramnath, Jordan D. Clark, Building and Environment, 2022, 108833, ISSN 0360-1323, <https://doi.org/10.1016/j.buildenv.2022.108833>.
5. “A Framework for Accelerating Graph Convolutional Networks on Massive Datasets”, Li X., Jin R., Ramnath R., Agrawal G. (2021) In: Mohaisen D., Jin R. (eds) Computational Data and Social Networks. CSoNet 2021. Lecture Notes in Computer Science, vol 13116. Springer, Cham. [https://doi.org/10.1007/978-3-030-91434-9\\_8](https://doi.org/10.1007/978-3-030-91434-9_8), December 2021.

6. "Urban Sustainability Observatories: Leveraging Urban Experimentation for Sustainability Science and Policy", Harvey J. Miller, Kelly Clifton, Gulsah Akar, Kristen Tufte, Sathya Gopalakrishnan, John MacArthur, Elena Irwin, Rajiv Ramnath, Jonathan Stiles, Issue 3.2, <https://hdsr.mitpress.mit.edu/pub/zunejoo2/release/3>, Harvard Data Science Review, May, 2021.
7. "Tweets can tell: activity recognition using hybrid gated recurrent neural networks", Renhao Cui, Gagan Agrawal, Rajiv Ramnath, Social Network Analysis and Mining (2020) 10:16 <https://doi.org/10.1007/s13278-020-0628-0>, Springer Nature, March 2020.
8. "Hierarchical categorization of big content using concept topology", Andrew Yates, Daniel Dotson, Stephanie Schulte, Rajiv Ramnath, Taylor and Francis Journal of Library Metadata, DOI:[10.1080/19386389.2018.1538610](https://doi.org/10.1080/19386389.2018.1538610), volume=18, pages=113 – 134, 2018.
9. "Second-Grade Urban Learners: Preliminary Findings for a Computer-Assisted, Culturally Relevant, Repeated Reading Intervention", Jessica G. Bennett, Ralph Gardner III, Gwendolyn Cartledge, Rajiv Ramnath, Education and Treatment of Children, Vol. 40, No. 2, 2017.
10. "NEWPATH: An innovative program to nurture IT entrepreneurs", Soundarajan, N., Ramnath, R., Weide, B., Lee, D., Camp, M., Advances in Engineering Education's Special Issue on Entrepreneurship, 2015.
11. "Culturally Relevant Literature: What Matters Most to Primary-Age Urban Learners", Gwen Cartledge, Susan Keeseey, Jessica Bennett, Rajiv Ramnath, Morris Council, Reading & Writing Quarterly, pp. 1-28 | DOI: 10.1080/10573569.2014.955225, January 2015.
12. "Effects of Culturally Relevant Materials on the Reading Performance of Second-Grade African Americans with Reading/Special Education Risk", Cartledge, G., Keeseey, S., Bennett, J., Gallant, D., & Ramnath, R. Multiple Voices, 2015.
13. "Identifying Knowledge Brokers and Their Role in Enterprise Research through Social Media", Xu Zhe, Jayashree Ramanathan, Rajiv Ramnath, IEEE Computer, Special Issue on Collaborative Information Seeking, March 2014.
14. "VDC-Analyst: Design and verification of virtual desktop cloud resource allocations", Prasad Calyam, Sripriya Seetharam, Khaled Salah, Rajiv Ramnath, Special issue on cloud networking and communications Computer Networks, 2014.
15. "Topology-Aware Correlated Network Anomaly Event Detection and Diagnosis", Prasad Calyam, Manojprasad Dhanapalan, Mukundan Sridharan, Ashok Krishnamurthy, Rajiv Ramnath, Springer Journal of Network and Systems Management, September 2013.
16. "VDPilot: Feasibility Study of Hosting Virtual Desktops for Classroom Labs within a Federated University System", Prasad Calyam, Alex Berryman, David Welling, Saravanan Mohan, Rajiv Ramnath, Jay Ramanathan, International Journal of Cloud Computing (IJCC), Inderscience Publications, 2013.
17. "Stakeholder Ontology and Mining for Improving Complex Services", Ramanathan, J., Ramnath, R., International Journal of Information Systems in the Service Sector, 5(2), 65-79, April-June 2013.
18. "Human-centric Composite Quality Modeling and Assessment for Virtual Desktop Clouds", Yingxiao Xu, Prasad Calyam, David Welling, Saravanan Mohan, Alex Berryman, and Rajiv Ramnath, International Journal on ZTE Communications, 2013.
19. "Simulation as a Service (SMaaS): A Cloud-Based Framework to Support the Educational Use of Scientific Software", David E. Hudak, Thomas Bitterman, Rajiv Ramnath, Prasad Calyam, Jay Ramanathan, Da Zhang, Da Cai, International Journal of Cloud Computing (IJCC), Inderscience Publications, 2013.

20. "Multi-Resolution Multimedia QoE Models for IPTV Applications", Calyam, P., Chandrasekaran, P., Trueb, G., Howes, N., Ramnath, R., Yu, D., Liu, Y., Xiong, L., Yang, D, International Journal of Digital Multimedia Broadcasting, vol. 2012, Article ID 904072, 13 pages, 2012.
21. "Utility-Directed Resource Allocation in Virtual Desktop Clouds", Calyam, P., Patali, R., Berryman, A, Lai, A. M., Ramnath, R., The International Journal of Computer and Telecommunications Networking (COMNET), July 2011.
22. "Kansei: A high-fidelity sensing testbed", Arora, A., Ertin, E., Ramnath, R., Nesterenko, M., Leal, W., Internet Computing, Special Issue on Large-Scale Sensor Networks, March 2006.
23. "Strategic Planning and Execution for Information-Technology Enabled Sense-and-Respond in Complex Public Organizations", Ramnath, R., Landsbergen, D., Communications of the ACM, special issue on Complex Adaptive Systems, 2005.
24. "Database design for real-time adaptations," Gopinath, P.S., Ramnath, R. and Schwan, K., Journal of Systems and Software, Volume 17, Issue 2, February 1992, Pages 155-167
25. "A Language and System for Parallel Programming," Schwan, K., Ramnath, R., Vasudevan S., and Ogle, D., IEEE Transactions on Software Engineering, April 1988.

**Conference publications (Refereed):**

1. "Efficient and Interpretable Information Retrieval for Product Question Answering with Heterogeneous Data", Biplob Biswas, Rajiv Ramnath, European Community for Neuro-Linguistic Programming 7th Workshop on e-Commerce and NLP (ECNLP 7), 2024 Joint International Conference on Computational Linguistics, Language Resources And Evaluation, May 20-25, Turin, Italy, 2024.
2. "Scalable Deep Metric Learning on Attributed Graphs", Xiang Li, Gagan Agrawal, Ruoming Jin, and Rajiv Ramnath, CSoNet 2023, 12th International Conference on Computational Data and Social Networks, Best Paper (Student), December 11<sup>th</sup>-13<sup>th</sup>, Hanoi, Vietnam, 2023.
3. "CrashFormer: A Multimodal Architecture to Predict the Risk of Crash", Amin Karimi Monsefi, Pouya Shiri, Ahmad Mohammadshirazi, Nastaran Karimi Monsefi, Sobhan Moosavi and Rajiv Ramnath, ACM SIGSPATIAL International Workshop on Advances in Urban AI, ACM SIGSPATIAL, November 13<sup>th</sup>-19<sup>th</sup>, Hamburg, Germany, 2023.
4. "Novel Physics-Based Machine-Learning Models for Indoor Air Quality Approximations", Ahmad Mohammadshirazi, Aida Nadafian, Amin Karimi Monsefi, Mohammad Rafiei and Rajiv Ramnath, MiLeTS'23: 9<sup>th</sup> KDD Workshop on Mining and Learning from Time Series, August 6<sup>th</sup>-10<sup>th</sup>, Long Beach, California, 2023.
5. "Insights from the HARP Framework: Using an AI-Driven Approach for Efficient Resource Allocation in HPC Scientific Workflows", Manikya Swathi Vallabhajosyula, Rajiv Ramnath, Short Paper, Systems and System Software track, 2023 Practice and Experience in Research Computing Conference Series (PEARC 2023), Best Paper in multiple categories: Systems & Systems Software Track, Short Overall (Student &/Or Non-Student) Category; Systems & Systems Software Track, Short Student Category; Phil Andrews Award for PEARC23 Best Paper Overall from among all tracks/categories; DOI: <https://doi.org/10.1145/3569951.3597595>, July 22-27, 2023, Portland, Oregon.
6. "Towards Characterizing DNNs to Estimate Training Time using HARP (HPC Application Resource (runtime) Predictor)", Manikya Swathi Vallabhajosyula, Rajiv Ramnath, Poster Paper, 2023 Practice and Experience in Research Computing Conference Series (PEARC 2023), DOI: <https://doi.org/10.1145/3569951.3597607>, July 22-27, 2023, Portland, Oregon.
7. "End-to-End LU Factorization of Large Matrices on GPUs", Yang Xia, Peng Jiang, Rajiv



- Ramnath, Gagan Agrawal, Principles and Practice of Parallel Programming (PPoPP 2023), February 25th-March 1<sup>st</sup>, 2023, Montreal, Canada.
8. “Establishing a Generalizable Framework for Generating Cost-Aware Training Data and Building Unique Context-Aware Walltime Prediction Regression Models”, Manikya Swathi Vallabhajosyula, Rajiv Ramnath, 20th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA 2022), 17-19 Dec. 2022, Melbourne, Australia.
  9. “Deep Graph Clustering with Random-walk based Scalable Learning”, Xiang Li, Ruoming Jin, Gagan Agrawal, Rajiv Ramnath, The IEEE/ACM International Conference on Social Networks Analysis and Mining (ASONAM 2022), Turkey 10-13 November 2022.
  10. “Will there be a construction? Predicting road constructions based on heterogeneous spatiotemporal data”, Amin Karimi Monsefi, Sobhan Moosavi, Rajiv Ramnath, Short Paper, 30th ACM International Conference on Advances in Geographic Information Systems, SIGSPATIAL 2022, Seattle, Washington, USA, <https://doi.org/10.1145/3557915.3560943>, November 1-4, 2022.
  11. “GAP: GPU Adaptive In-situ Parallel Analytics”, Haoyuan Xing, Gagan Agrawal, Rajiv Ramnath, The 31st International Conference on Parallel Architectures and Compilation Techniques (PACT), October 10-12, 2022.
  12. “Towards Practical, Generalizable Machine-Learning Training Pipelines to build Regression Models for Predicting Application Resource Needs on HPC Systems”, Manikya Swathi Vallabhajosyula, Rajiv Ramnath, Short Paper, Application and Software Track, 2022 Practice and Experience in Research Computing Conference Series (PEARC 2022), Boston, Massachusetts, July 10-14, 2022.
  13. “Retrieval Based Response Letter Generation for a Customer Care Setting”, Biplob Biswas, Renhao Cui, Rajiv Ramnath, Industry Track, 2022 Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2022), Seattle, Washington, July 10–15, 2022.
  14. “A Structure-Focused Deep Learning Approach for Table Recognition from Document Images”, Mengxi Zhou, Rajiv Ramnath, IEEE Computers, Software, and Applications Conference (COMPSAC) 2022, Torino, Italy, June 27<sup>th</sup> – July 1<sup>st</sup>, 2022.
  15. “PROWESS: An Open Testbed for Programmable Wireless Edge Systems”, Jayson Boubin, Avishek Banerjee, Jihoon Yun, Haiyang Qi, Yuting Fang, Steve Chang, Rajiv Ramnath and Anish Arora, Practice & Experience in Advanced Research Computing (PEARC) Conference Series, 2022, July 10<sup>th</sup>-14<sup>th</sup>, 2022.
  16. “Can machine learning predict high-concentration events before they happen?”, Clark, Jordan, Mohammadshirazi, Ahmad, Ramnath, Rajiv, 17th International Conference of the International Society of Indoor Air Quality & Climate (Indoor Air), June 12<sup>th</sup> to 16<sup>th</sup> Kuopio, Finland 2022.
  17. “Scaling and Selecting GPU Methods for All Pairs Shortest Paths (APSP) Computations”, Yang Xia, Peng Xiang, Rajiv Ramnath, Gagan Agrawal, 36th IEEE International Parallel & Distributed Processing Symposium, May 30 – June 3, 2022.
  18. “Constrained-Embedded Paraphrase Generation for Commercial Tweets”, Renhao Cui, Gagan Agrawal and Rajiv Ramnath, 2021 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), Industry Track, Virtual Conference, November 8-11, 2021.
  19. “LocationTrails: A Federated Approach to Learning Location Embeddings”, Saket Gurukar, Srinivasan Parthasarathy, Rajiv Ramnath, Catherine Calder and Sobhan Moosavi, 2021 IEEE/ACM International Conference on Advances in Social Networks

- Analysis and Mining (ASONAM), Industry Track, Virtual Conference, November 8-11, 2021.
20. "An automated cost saving tool for detection of infants with cramped synchronized general movements combining sensor fabric technology, deep learning and a pragmatic interface", Qiwei Yang, Theodore Allen, Ping Zhang, Rajiv Ramnath, Knowledge Discovery and Data Mining (KDD) 2021 Workshop on Machine Learning for Consumers and Markets, August 14-18, 2021.
  21. "Combining Markov Decision Processes with Decision Trees For Semi-Automatic State Identification Applied to Cyber Maintenance for Business Savings", Qiwei Yang, Theodore Allen, Gagan Agrawal, Rajiv Ramnath, Knowledge Discovery and Data Mining (KDD) 2021 Workshop on Machine Learning for Consumers and Markets, August 14-18, 2021.
  22. "Scaling Sparse Matrix Multiplication on CPU-GPU Nodes", Yang Xia, Gagan Agrawal, Peng Jiang, Rajiv Ramnath, 35th IEEE International Parallel & Distributed Processing Symposium (IPDPS), Portland, Oregon May 17-21, 2021.
  23. "MoHA: A Composable System for Efficient In-Situ Analytics on Heterogeneous HPC Systems", Haoyuan Xing, Gagan Agrawal, Rajiv Ramnath, Supercomputing 2020, Atlanta, Georgia, November 15-20, 2020.
  24. "Sequence-to-Set Semantic Tagging for Complex Query Reformulation and Automated Text Categorization in Biomedical IR using Self-Attention", Manirupa Das, Juanxi Li, Eric Fosler-Lussier, Simon Lin, Steve Rust, Yungui Huang and Rajiv Ramnath, BioNLP 2020 Workshop on Biomedical Natural Language Processing, July, 2020.
  25. "Accident Risk Prediction based on Heterogeneous Sparse Data: New Dataset and Insights", Sobhan Moosavi, Mohammad Hossein Samavatian, Srinivasan Parthasarathy, Radu Teodorescu and Rajiv Ramnath, 27th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems, Chicago, Illinois, 5-8 November, 2019.
  26. "Tweets Can Tell: Activity Recognition using Hybrid Long Short-Term Memory Model", Renhao Cui, Gagan Agrawal, Rajiv Ramnath, 2019 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), Vancouver, Canada, 27-30 August, 2019.
  27. "Short and Long-term Pattern Discovery Over Large-Scale Geo-Spatiotemporal Data", Sobhan Moosavi, Mohammad Hossein Samavatian, Arnab Nandi, Srinivasan Parthasarathy and Rajiv Ramnath, KDD 2019, Anchorage, Alaska, August 2019. Best Poster Award.
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  29. "SmartDashCam: Automatic Live Calibration for DashCams", Gopi Krishna Tummala, Tanmoy Das, Prasun Sinha, Rajiv Ramnath, International Conference on Information Processing in Sensor Networks (IPSN), Montreal, Canada, April 16<sup>th</sup>-18<sup>th</sup>, 2019.
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#### **Patents and Invention Disclosures:**

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2. William McMurtry, Jeremy Morris, Rajiv Ramnath, Robert Bowron, “Information Retrieval for Call Center Quality Assurance”, Invention Disclosure T2020-300, 4/14/2020.
3. Manirupa Das, Eric Fosler-Lussier, Rajiv Ramnath, “Concept Discovery from Text via Knowledge Transfer”, Invention Disclosure T2020-153, 11/04/2019.
4. Sobhan Moosavi, Rajiv Ramnath, “Driving Style Representation in Convolutional Recurrent Neural Network Models of Driver Identification”, Invention Disclosure T2020-139, 10/23/2019.
5. Gopi Krishna Tummala, Derrick Cobb, Prasun Sinha and Rajiv Ramnath, “Methods and Apparatus for enabling Mobile communication device based Secure Interaction from

- Vehicles through Motion Signatures", U.S. Patent Application No. 15/060, 494. Filed July 2018, Issued 10/18/2019.<sup>[SEP]</sup>
6. Gopi Krishna Tummala, Prasun Sinha, Rajiv Ramnath, "DashCalib: Live Dashboard Camera Calibration", Invention Disclosure T2018-176, 11/27/2017
  7. Gopi Krishna Tummala, Derrick Cobb, Prasun Sinha, Rajiv Ramnath, "Soft-Swipe: Enabling Smartphone based Secure Interaction from Vehicles through Motion Signatures", Invention Disclosure T2017-371, 4/6/2017.
  8. Ahlqvist, Karl "Ola", Heckler, Andrew, Ramnath, Rajiv, "Online Map Games for Teaching and Learning through a Real-World Spatial Perspective", Invention Disclosure T2017-002, 7/5/2016
  9. Cartledge, Gwendolyn, Bennett, Jessica, Bishop, Rudine, Damer, Mary, Fosler-Lussier, John "Eric", Gardner, Ralph, Keeseey, Susan, Lynch, Thomas, Ramnath, Rajiv "Reading RACES (Relevant and Culturally Engaging Stories): Reading Fluency Software for First- and Second-Grade Urban Learners", Invention Disclosure T2015-147, 1/7/2015.
  10. Bolinger, Joe, Horvath, Gregory, Ramanathan, Jay, Ramnath, Rajiv, "Document-Centric Collaborative Spaces for Increased Traceability in Knowledge-Intensive Processes", T2010-054, 09/23/2009.

#### **Doctoral Dissertations Advised and Co-Advised:**

1. "Development of Deep Learning Models for Attributed Graphs", Li, Xiang, co-advisor: Gagan Agrawal, May 2023.
2. "Solving Scaling Issues on a Single GPU", Xia, Yang, co-advisor: Gagan Agrawal, August 2022.
3. "Decision Making and Classification for Time Series Data", Yang, Qiwei, co-advisor: Theodore Allen, May 2022.
4. "Optimizing array processing on complex I/O stacks using indices and data summarization", Xing, Haoyuan, co-advisor: Gagan Agrawal, December 2021.
5. "Improved Utilization of Advertising through Social Media", Cui, Renhao, co-advisor: Gagan Agrawal, December 2020.
6. "Telematics and Contextual Data Analysis and Driving Risk Prediction", Moosavi, Sobhan, co-advisor: Srini Parthasarathy, December 2019.
7. "Neural Methods Towards Concept Discovery from Text via Knowledge Transfer", Das, Manirupa, co-advisor: Eric Fosler-Lussier, December 2019.
8. "Automatic Camera Calibration Techniques for Collaborative Vehicular Applications", Tummala, Gopikrishna, co-advisor: Prasun Sinha, May 2019.
9. "Augmenting Collective Expert Networks to Improve Service Level Compliance", Moharreri, Kayhan, lead advisor: Jayashree Ramanathan, co-advisor: Gagan Agrawal, May 2017.
10. "Data Fusion Ontology: Enabling A Paradigm Shift From Data Warehousing To Crowdsourcing For Accelerated Pace Of Research", Raje, Satyajeet, lead advisor: Jayashree Ramanathan, co-advisor: Phillip Payne, May 2016.
11. "Expertise Retrieval in Enterprise Microblogs with Enhanced Models, and Brokers", Xu, Zhe, lead advisor: Jayashree Ramanathan, co-advisor: Eric Fosler-Lussier, May 2014.
12. "A Framework for Promoting Teacher Self-Efficacy with Mobile Reusable Learning Objects", External Examiner, Power, R., Center for Distance Education, Athabasca University, Alberta, Canada, lead advisor Ally, M., co-advisor Cristol, D., January 2015.
13. "A Synergistic Framework for Geographic Question Answering", Chen, W., Department of Geography, College of Arts and Sciences, lead adviser Xiao, N., co-advisor Fosler-Lussier, E., December 2013.

14. “The Effects of Culturally Responsive Computer-based Social Skills Instruction on the Social Skill Acquisition and Generalization of Urban 6th - Grade Students with Emotional and Behavioral Disorders”, Robinson-Ervin, P., College of Education and Human Ecology, lead advisor Cartledge, G., December 2012.
15. “Micro-Modelling: A Visual Design Framework for Collaborative Tools in Complex Service Organizations”, Bolinger, J., lead advisor Ramanathan, J., December 2011.
16. “Design of Mobile and Static Sensor Fabrics”, Sridharan, M., lead advisor Arora, A., March 2011.

**Masters’ of Fine Arts Theses Co-Advised:**

1. “Reshaping Visual Communication Design Curriculum to Support Collaboration with Computer Science and Engineering”, Master of Fine Arts thesis, Ribeiro, B., lead advisor: R. Brian Stone, co-advisor: Judy Forlizzi, June 2012.
2. “Redefining the Textbook: A User-Centered Approach to the Creation, Management and Delivery of Digital Course Content in Higher Education”, Master of Fine Arts thesis, Ganci, A., lead advisor: Paul Nini, co-advisor: R. Brian Stone, August 2011.

**Masters Theses:**

1. “Long Document Understanding using Hierarchical Self Attention Networks”, Akshay Kekuda, co-advisor: Eric Fosler-Lussier, December 2022.
2. “Generalization of Machine Learning Model and Various Applications in NLP and Vision”, co-advisor: Thomas A. Bihari.
3. “Real Time Presentation”, Ortiz, A., co-advisor: Neelam Soundarajan, May 2017.
4. “A Comparison of Machine Learning Techniques on Automated Essay Grading and Sentiment Analysis”, Sundaram, A., co-advisor: Jay Ramanathan, May 2015.
5. “A Software Product Line Engineering Approach to Building A Modeling and Simulation as a Service (M&SaaS) Application Store”, Diwan, P., co-advisors: Jay Ramanathan, Thomas Bitterman, December 2013.
6. “An Investigative and Goal driven Workbench for Text Extraction and Image Processing”, Tumu, S., co-advisor: Jay Ramanathan, September 2013.
7. “Teaching Software Engineering For The Modern Enterprise”, Herold, M., co-advisor: Jay Ramanathan, July 2013.
8. “Analysis and Categorization of 2D Multi-Touch Gesture Recognition Techniques”, Singhal, A., co-advisor: Jay Ramanathan, May 2013.
9. “SMART – An Architecture Framework for Web Applications”, Ganesan, S., co-advisor: Jay Ramanathan, May 2013.
10. “Analysis of Garbage Collector Algorithms in Non-Volatile Memory Devices”, Mahadevan-Muralidharan, A., co-advisor: Jay Ramanathan, May 2013.
11. “Knowledge-based Data Extraction Workbench For Eclipse”, Rangaraj, J., co-advisors: Ramanathan, J., December 2012.
12. “Approaches to Automatically Constructing Polarity Lexicons for Sentiment Analysis on Social Networks”, Khuc, V., co-advisor: Jay Ramanathan, August . 2012.
13. “Bill Share – Capacity Planning and Management”, Balaraman, S., co-advisors: Gagan Agrawal, Jay Ramanathan, August 2012.
14. “Using Automated Extraction of the Page Component Hierarchy to Customize and Adapt Web Pages to Mobile Devices”, Wei, C., co-advisors: Ramanathan, J., June 2012.
15. “Dynamic Generation of Musical Notation from MusicXML Input on an Android Tablet”, Housley, L., co-advisors: Rogers, P., Ramanathan, J., June 2012.
16. “Analysis and Evaluation of an Integrated Web Services Framework”, Cai, D., co-advisors: Bitterman, T., Ramanathan, J., June 2012.

17. "Integrated Testing Tools for End-to-End Testing", Zhang, D., co-advisors: Bitterman, T., Ramanathan, J., June 2012.
18. "Detecting Self-Correlation of Nonlinear, Lognormal, Time-Series Data via DBSCAN Clustering Method, Using Stock Price Data as Example", Huo, Shiyin., co-advisors: Ramanathan, J., December 2011.
19. "An Evaluation Model for Application Development Frameworks for Web Applications", Lee, C., co-advisors: Ramanathan, J., Bitterman, T., Autumn 2011.
20. "YAVM-Yet Another Virtual Machine", Sivadas, N., co-advisors: Ramanathan, J., Parker, K., December 2011.
21. "Design and Development of a Software Operating Platform for the eMote based on .NET Microframework", Natarajan, K., co-advisors: Ramanathan, J., Parker, K., August 2011.
22. "Designing Object Oriented Software Applications within the Context of Software Frameworks", Ali, Z., co-advisor: Ramanathan, J., August 2011.
23. "Usable, lightweight and secure, architecture and programming interface for integration of Wireless Sensor Network to the Cloud", Patil, S., co-advisor: Ramanathan, J., August 2011.
24. "Challenges of a Pose Computation Augmented Reality Game Application", Wang, C., co-advisor: Ramanathan, J. June 2011.
25. "Performance Monitoring of Network Systems", Sreenivasan, A., co-advisors: Jay Ramanathan, Mark Fullmer, June 2011.
26. "Framework for Analyzing the Success of Open Source Software", Chockalingam, A., co-advisors: Ramanathan, J., Bitterman, T. June 2011.
27. "Application-Aware Resource Management", Ghadse, S., co-advisors: Ramanathan, J., Eveland, W., March 2011.
28. "A Study of Software Development Practices for Micro Teams", Deshpande, S., co-advisor: Ramanathan, J., March 2011
29. "Enhancing Location-Based Content Delivery Through Semi-Automated Generation of User Profiles", Lal, N., co-advisor: Ramanathan, J., December 2010.
30. "Role-Based Access Control in Collaborative Research Environments," Davuluri, C., co-advisors: Freitas, M., Ramanathan, J., August 2010.
31. "Knowledge Based Topology Discovery and Geo-localization," Shelke, Y., co-advisors: Ramanathan, J., Ahlqvist, O., June 2010.
32. "Towards Metadata Driven User Interfaces," Mukhedkar, R., co-advisors: Ramanathan, J., Machiraju, R., June 2010.
33. "A Sentiment Analysis Model Integrating Multiple Algorithms and Diverse Features," Zhe, X., co-advisors: Belkin, M., Fang, H. June 2010
34. "Data Integration in Reporting Systems using the Enterprise Service Bus," Masters' Thesis, Koppal, K., co-advisors: Sivilotti, P., Ramanathan, J, Autumn 2009.
35. "Green Computing – Power Efficient Management in Data Centers Using Resource Utilization as a Proxy for Power," DaSilva, R., co-advisors: Arora, A., Ramanathan, J. December 2009
36. "Extracting Opinions from Blog Comments: Analysis, Design and Applications," Masters' Thesis, Raghavan, P., co-advisors: Smith, P., Ramanathan, J., Fang. H., December 2009.
37. "MetaDB – Meta-Information-Based Information Storage and Retrieval for Complex Experimental Data", Masters' Thesis, Kumar, A., co-advisors: Ramanathan, J., Freitas, M., June 2009.

38. "Issues in Implementing Complex Configuration," Masters' Thesis, Gupta, V., co-advisor: Soundarajan, N., Ramanathan, J, June 2009
39. "IGNIS - An Agent-Based Simulator For Evaluating The Complex Adaptive Behavior Of Pervasive Computing Applications," Masters' Thesis, Dombroviak, K., co-advisor: Arora, A., May 2007.
40. "PSIFE – An Eclipse-based Environment for Facilities Planning," Masters' Thesis, Mampilly, T., co-advisors: Irani, S., Rountev, A., March 2007
41. "Framework for Driving Focused, Organizationally-aligned Innovation Using Six-Sigma," Masters' Thesis, Tountcheva, R., co-advisor: Long, T. J., June 2006

**Masters Theses Co-Advised:**

1. "Information Retrieval for Call Center Quality Assurance", McMurtry, W., Advisor Jeremy Morris, May 2020.
2. "Engineering For Evolution Of Software To A Production Environment", Chalasani, P., Advisor: Jay Ramanathan, May 2014.
3. "Effective Capacity Planning of the Virtual Environment using Enterprise Architecture", Mahimane, A., lead advisor: Jay Ramanathan, May 2013.
4. "Improving Adherence to Agile Manifesto Principles in an Agile Methodology – A Case Study", Ram, Narendhira, lead advisor: Jay Ramanathan, May 2013.
5. "Adaptive Overlay Management using OpenFlow for Elastic Cloud Applications", Mohan, S., lead advisor: Prasad Calyam, co-advisor: Jay Ramanathan, May 2013.
6. "Network Measurement Tool Components for Enabling Performance Intelligence within Cloud-based Applications", Selvadurai, A., lead advisor: Prasad Calyam, co-advisor: Jay Ramanathan, May 2013.
7. "Pulse Doppler Radar Target Recognition", Kizakhhel, V., lead advisor: Ashok Krishnamurthy, May 2013.
8. "Secure Middleware For Federated Network Performance Monitoring", Kulkarni, S., lead advisor: Prasad Calyam, co-advisor: Jay Ramanathan, May 2013.
9. "Moving from Data Delivery to Knowledge Services Platforms", Raje, S., lead advisor: Jay Ramanathan, December 2012.
10. "Architecture Evaluation of a Search Engine (ResearchIQ) Affecting Usability", Srivastava, A., lead-advisor: Jay Ramanathan, December 2012.
11. "A Comparative Study of Feature Selection Methodologies in a Readability Assessment Framework for Children's Literature", Singh, R., lead advisor: Fossler-Lussier, E., December 2012.
12. "Feasibility of Automated Estimation of Software Development Effort in Agile Environments", Sapre, A., lead advisor: Jay Ramanathan, August 2012.
13. "Architectural Analysis and Performance Characterization of NVIDIA GPUs using Microbenchmarking", Saktesh, S. A., lead advisor: P. Sadayappan, Autumn 2012.
14. "Network Performance Monitoring", Ramamurthy, S., lead advisor: Prasad Calyam, August 2012.
15. "Clone Detection & Classification Method (CDCM): Towards an automatic approach for bootstrapping reuse efforts in an organization", Sood, R., lead advisor: Jay Ramanathan, August 2012.
16. "Transformation from Linear Development Model to Iterative Development within a Waterfall Environment : A Case Study", Shirke, A., lead advisor: Jay Ramanathan, August 2012.
17. "Defragmentation Of Resources In Virtual Desktop Clouds For Cost-Aware Utility-Maximal Allocation", Venkataraman, A., lead adviser: Prasad Calyam, co-adviser: Jay Ramanathan, August 2012.

18. “Participatory Strategic Planning System For Complex Service Environments”, Mulay, A., lead advisor: Jay Ramanathan, August 2011.
19. “Hezo: An Intelligent Social System for Extreme Scale Collaborations”, Jadda, R., lead advisor: Jay Ramanathan, June 2011.
20. “Intelligent Techniques for Data- Information- Knowledge Evolution”, Agrawal, A., lead advisor: Jay Ramanathan, June 2011.
21. “Comparative Analysis of Low-Power Wireless Protocols for Biomedical Sensor Applications”, Stohs, N., lead advisor: Emre Ertin, June 2011.
22. “ACE Student Tracker”, Ma, C., lead advisor: Furrukh Khan, June 2011.
23. “Utility-Directed Resource Allocation in Virtual Desktop Clouds”, Patali, R., lead-advisor: Prasad Calyam, co-advisor: Gagan Agrawal, June 2011.
24. “Knowledge-Based Performance Management Framework”, Datta, R., lead advisor: Ramanathan, J., December 2010.
25. “A Shared Vocabulary for Efficient decision making for Software Development Organizations”, Nagarajan, P., lead advisor: Ramanathan, J., co-advisor: Parthasarathy, S., August 2010.
26. “Agility Performance Framework for Education and Quicker Adoption,” Harbhajanka, V., co-advisors: Ramanathan, J., Sivilotti. P., June 2010.
27. “Exploring a Framework for Goal-Driven Collaboration through Serious Gaming,” Loffing, T., lead advisor: Ramanathan, J., Ahlqvist, O., June 2010.
28. “Sense Respond Environment for Adaptive Participatory Services,” Singh, N., lead advisor: Ramanathan, J., Ahlqvist, O., June 2010.
29. “Collaborative Spaces for Increased Traceability in Knowledge-Intensive Document-Based Processes”, Masters’ Thesis, Horvath, G., lead advisor: Ramanathan, J., co-advisor: Weide, B., August 2009
30. “Business-IT Traceability for Complex System Improvement,” Masters’ Thesis, Mukri F., lead advisor: Ramanathan, J., co-advisor: Desai, A., August 2009

**Masters Projects Advised and Co-advised (lead advisor unless specified otherwise):**

1. “Pediatric Care with Information Retrieval and Generative AI”, Aditi Joshi, Committee Member: Thomas Bihari, May 2024.
2. “Proof of Concept: ICICLE Intelligence Plane for Smart Scheduler”, Sandeep Satish Budhya, Committee Member: Thomas Bihari, May 2024.
3. “An Application-Driven Exploration of the Capabilities and Limitations of Foundation Models for Artifact Generation”, Grant Arnold, Committee Member: Arnab Nandi, May 2024.
4. “Streamlining Wet Lab Protocol with Large Language Models”, Sharyu Deshmukh, Advisor: Raghu Machiraju, May 2024.
5. “Dual Endeavors: Path to Improve Self-Supervised Image-Language Models and Retinal Image Vessel Wall Segmentation”, Param Manoj Bhavsar, Co-Advisor: Yanhui Ma (College of Optometry and Ophthalmology), Committee Member: Thomas Bihari, May 2024.
6. “Self-Supervised Learning of Vision Transformers”, Utkarsh Pratap Singh Jadon (Electrical and Computer Engineering), Committee Member: Lisa Fiorentini, May 2024.
7. “AI-Enabled Smart Scheduler for Optimizing Resource Utilization in HPC”, Bhargavi Dwivedi, Electrical and Computer Engineering, May 2024.
8. “Pediatric Healthcare Solution with Information Retrieval and Recommendation Generation”, Nirmal Philipose Mathew, Committee Member: Thomas Bihari, May 2024.
9. “An AI-based platform for developmental and behavioral care for children”, Aditi Joshi, Committee Member: Thomas Bihari, May 2024.

10. "ECHO – Education, Computer Science, Health at OSU", Sahithi Katreddi, Advisor: Thomas Bihari, Committee Members: Leon Madrid, Tzu-Yung Lin, May 2024.
11. "SelfReinforce: Bridging the Exploration Gap in Reinforcement Learning through Self-Supervised Learning", Rachana Kulkarni, committee member: Thomas Bihari, May 2024.
12. "CRISPR - Cas12 sgRNA System Design Using Deep Learning AND High Performance Computing Application Runtime Predictor", Akanksha Jain, co-advisor: Lijun Cheng, committee member: Thomas Bihari, May 2024.
13. "911 AI Predict, The 911 Artificial Intelligence Platform for Recognition of Emergencies through Directed Classification AND Deep Reinforcement Learning for Drug Design with High PCE Values", Harshini Kavuru, co-advisors: Lijun Cheng, committee member: Thomas Bihari, May 2024.
14. "Adding Artificial Intelligence and Machine Learning Capabilities to a Commercial Business Process Management Framework", Ashvini Kulshrestha, committee member: Thomas Bihari, May 2024.
15. "Authentication in Firecell Labkit", Taniya Soman, May 2024.
16. "Software System Modernization", Anuja Dixit, committee member: Thomas Bihari, May 2024.
17. "Real time streaming in TransMax Cyberinfrastructure for Research", Srivardhan Reddy Kalli, co-advisors: Thomas Bihari, May 2023.
18. "ECHO Project", Prata, Surya Pavan Saketh, advisor: Thomas Bihari, Leon Madrid, Tzu-Jung Lin, May 2023.
19. "ECHO Project", Kndubhotla, Spandana, advisor: Thomas Bihari, Leon Madrid, Tzu-Jung Lin, May 2023.
20. "Hyper Space", Parth Kharwar, committee member: Thomas Bihari, May 2023.
21. "AI-Based 911 Response Dispatching", Amireddy, N., co-advisors: Thomas Bihari, Travis Sharkey-Toppen, Henry Wang, December 2022.
22. "Leveraging Artificial Intelligence to accelerate Life Saving 911 care", Rachana Mamila, co-advisors: Thomas Bihari, Travis Sharkey-Toppen, Henry Wang, December 2022.
23. "Data Collection for Misinformation Detection and the ICICLE Reference Architecture", Deepak Suresh, co-advisor: Thomas Bihari, December 2022.
24. "HARP: HPC Runtime Application Predictor", Saisree Miriyala, co-advisor: Thomas Bihari, December 2022.
25. "HARP - HPC Application Runtime Predictor", Sainath Prasanna, co-advisor: Thomas Bihari, December 2022.
26. "H2Ohio Data Synthesis Project", Ryan Hamza, Advisor: Srini Parthasarathy, May 2022
27. "MindWatcher: Mindfulness-Based Collaborative Social Reasoning online platform", Yu Jiang, Advisor: Thomas Bihari co-Advisors: Tzu-Jung Lin, Leon Madrid, May 2021.
28. "MindWatcher: Mindfulness-Based Collaborative Social Reasoning online platform", Lance Chen, Advisor: Thomas Bihari co-Advisors: Tzu-Jung Lin, Leon Madrid, May 2021.
29. "Accountable Algorithms" Kuntal Roy, Advisor: Thomas Bihari, May 2021
30. "Information Extraction from Gene Sequencing Scientific Documents", Chanana, R., co-advisors: Bryan Carstens, Jian Chen, May 2021.
31. "The Woods: A Photon Unity Networking based Augmented Reality Game Project Report", Sruthi Ammanagiri, co-advisors: Kyoung-Lee Swearingen (co-lead), Scott Swearingen (co-lead), May 2021.
32. "Generating Knowledge graphs on scientific execution workspace", Gulati, R., co-advisors: Bryan Carstens, Jian Chen, December 2020.



33. “Spatial Transcriptomics Data Clustering and Visualizing and Inferring a Disease-Disease Network Using Biomedical Literature Mining”, Amireddy, T., co-advisor Dongjun Chung (lead), May 2020.
34. “Infant Mortality Research Partnership and Air Quality Research Project”, Bhimani, D., co-advisors: Harvey Miller, Adam Porr (lead), Jordan Clark (lead), Thomas Bihari.
35. “Customer Service Representative Call Scoring and Analysis”, Suri, B., co-advisor: Eric Fosler-Lusier (lead), May 2020.
36. “Fault Tree generation from Piping and Instrumentation Diagrams using Deep Learning”, Thik, J., co-advisors Thomas Bihari, Carol Smidts (lead), May 2020.
37. “OIEx Projects”, Ponnuswamy, K., co-advisors: Leon Madrid, (lead) Thomas Bihari, May 2020.
38. “Accountable Algorithms”, Roy, K., co-advisor: Thomas Bihari (lead), May 2020.
39. “GeoHAI Web App Development”, Atyam, P., co-advisors: Harvey Miller, Adam Porr (lead), Thomas Bihari, May 2020.
40. “Email Content Classification Using Google BERT Transformers”, Banerjee, S., co-advisors Leon Madrid, Thomas Bihari, December 2020.
41. “Building a Demo for Interactive Semantic Parsing”, Ranganathan, V., co-advisor Huan Sun (lead), December 2020.
42. “Klarite iOS App and OIEx Dashboard”, Deep, I., Leon Madrid (lead), co-advisor Jeremy Morris, December 2020.
43. “SLURM Deployment on AWS”, Chintalapati, A., co-advisor Thomas Bihari, May 2020.
44. “Maintenance Invoice Decision Support System”, Breckenridge, D., lead advisor Jeremy Morris, May 2020.
45. “Intent Identification and Slot-Filling, Focal Map Upload Tool”, Mathiazhagan, S., co-Advisor David Ogle, May 2020.
46. “Sensor Integration into Web Application”, Deo, A., lead advisor Thomas Bihari, May 2020
47. “Email Virtual Assistant”, Chattopadhyay, M., co-advisor David Ogle, May 2020.
48. “CETI Commons Infrastructure”, Sharma, A., co-advisor Thomas Bihari, May 2020.
49. “Fleet Lifecycle Cost and Parts Prediction using Machine Learning”, Kumar, M., ECE, co-advisor Thomas Bihari. May 2020.
50. “Intent Detection And Slot Filling”, Pujar, K., co-advisor Thomas Bihari May 2020.
51. “Klarite Application”, Patra, S., lead advisor Leon Madrid, co-advisor Thomas Bihari, May 2020.
52. “Deployment of CETI Infrastructure–A High Performance Computing Cluster”, Achyutha Rami Reddy, co-advisor Thomas Bihari, May 2020.
53. “Automatic Medical Reimbursement Adjudication”, Zhou, M., co-advisor David Ogle, April 2019.
54. “Photo Damage Assessment”, Joshi, A., co-advisor David Ogle, May 2019.
55. “Reading RACES: A browser enabled Speech Recognizer meant to help kids improve their reading skills”, Burujapalli, L., co-advisor Jeremy Morris, May 2019.
56. “Paraphrase Generation of Commercial Tweets”, Sunil, S., co-advisor Gagan Agrawal, May 2019.
57. “Survival Analysis – Annuity Profitability”, Thoom, S., co-advisor, David Ogle, April 2019.
58. “Application of Deep Learning Providing Decision Support to Aircraft Maintenance”, Saraf, M., co-advisor David Ogle, May 2019.

59. "Application of Machine Learning to perform Task Standardization", Modi, S., co-advisor David Ogle, May 2019.
60. "Traffic Incident Visualization" Mingxin Lu, co-advisor David Ogle, May, 2019.
61. "SANG Project", Devi Mithra Jainendra Kumar, advisor David Ogle, December 2018.
62. "SANG Project", Yihang Du, advisor David Ogle, December 2018.
63. "School2Biz: A Social Network for Educators and the Community", Campbell, D., co-adviser: Jeremy Morris, May 2016.
64. "Scheduling Optimizer", Narasimhan, J., co-adviser: Jeremy Morris, January 2016.
65. "Service Metrics Generation for the Office of the CIO", Srikanth, A. co-advisers Jayashree Ramanathan, Paul Sivilotti, Janette Ashcraft, December 2015.
66. "Geogame function extension design and Implementation", Jiang, P. adviser: Ola Ahqvist, December 2015.
67. "System Dynamics Model for Medicaid Eligibility Evaluation", Shah, G. advisor: Anand Desai, May 2015.
68. "Study and Analysis of Modeling Techniques", Chandra, Jigar, advisor: Anand Desai, May 2015.
69. "OPD Web Portal", Sonawane, Abhang, co-advisor: Jay Ramanathan, sponsor: John Thomas, May 2015.
70. "OARnet Internal Management Tools", Kuriakose, Ajay, supervisor: Mark Fullmer, committee member: Gagan Agrawal, May 2015.
71. "Geogame Water Model and Student Testing", Tantri, Aneesh, committee member: Gagan Agrawal, sponsor: Ola Ahlqvist May 2015.
72. "SoberTool Android Application", Krishnamurthy, Aneeth, committee member: Gagan Agrawal, project sponsor: Paul Caimi, May 2015.
73. "NoAlert", Ganesh, Asvin Vaidyanathan, committee member: Gagan Agrawal, May 2015.
74. "Application Error Reporting with Incident Management Framework", Jeyaram, Bhilanan, co-advisor: Jay Ramanathan, May 2015.
75. "Demographics of Twitter Users using First-Name Priors", DaSilva, Cajetan, co-advisor: Jay Ramanathan, supervisors: Luke Molnar, Vinh Khuc, May 2015.
76. "CONSIDER in GeoGame", Karan Tilak Kumar, co-advisor: Neelam Soundarajan, May 2015.
77. "AIML Based Chatbot as a Service in Android", Sundarajan, Mukundan, co-advisor: Jay Ramanathan, May 2015.
78. "Persuasion API", Nagarithnam, Naveenraj, co-advisor: Jay Ramanathan, May 2015.
79. "Geogame Data Analytics as a prerequisite for ABM", Khodke, Nayan, co-advisor: Ola Ahlqvist, committee member: Gagan Agrawal, May 2015.
80. "Persuasive Recommendation Engine", Choudhary, Neha, co-advisor: Jay Ramanathan, May 2015.
81. "PEV Communication Infrastructure Standards", Dasari, Raghuram, supervisor: B.J. Yurkovich, co-advisor: Jay Ramanathan, May 2015.
82. "Classifier Based Defect Prediction Using Defect and Log Data", Dorairaj, Sham Sunder, supervisor: N.B. Murthy, co-advisor: Jay Ramanathan, May 2015.
83. "Designing a Scalable Containerized Architecture for the Open Access Corpus", Agarwal, Shashank, co-advisor: Jay Ramanathan, May 2015.
84. "Utility Meter Reader Android Application", Sreethar, Sreeram, committee member: Gagan Agrawal, May 2015.
85. "Cube4 Software for ACA and IRS", Shankar, Swapna, co-advisor: Jay Ramanathan, project sponsor: Louise Stonehouse, May 2015.

86. “Comparing two .NET projects with respect to configurability”, Chen, Zhaoyi, co-advisor: Jay Ramanathan, May 2014.
87. “Extracting and Visualizing Code Complexity on Enterprise Applications”, Ye, S., co-advisor: Jay Ramanathan, supervisor: N.B. Murthy, May 2014.
88. “Registry of Organic Operations Tracking System”, Li, H., co-advisor: Jay Ramanathan, May 2014.
89. “Unique Words Analysis based on LDA model”, Qiu, X., advisor: Chris Stewart, May 2014.
90. “Implementation of a GIS-based Geographic Question Answering System”, Chen, W., co-advisors: Jay Ramanathan, Ningchuan Chao, December 2013.
91. “Automatic Mapping of EDI documents“, Singh, A., co-advisor: Jay Ramanathan, May 2013.
92. “Drupal Portal Development at the Ohio Supercomputer Center”, Li, Y., co-advisors Thomas Bitterman, Jay Ramanathan, May 2013.
93. “Software Instrumentation for Speech Applications”, Srivathsan, A., co-advisor, Jay Ramanathan, May 2013.
94. “Analysis of software development practices followed in some of the projects that I have been part of”, Navaneethakrishnan, K., co-advisor: Jay Ramanathan, May 2013.
95. “Intelligent Dashboard for Network Performance Monitoring and Diagnosis”, Tayal, C., lead advisor: Prasad Calyam, co-advisor: Jay Ramanathan, May 2013.
96. “Master Genome Tracking System”, Xie, R., co-advisor: Jay Ramanathan, May 2013.
97. “Typing Tutor Application Project Report”, Lu, Y., co-advisor: Jay Ramanathan, May 2013.
98. “Drupal Portal Development at the Ohio Supercomputer Center”, Li, Yixue, co-advisors: David Hudak, Thomas Bitterman, Jay Ramanathan. May 2013.
99. “Project Report: Using Openflow To Adaptively Manage Network Traffic In A Wide-Area Open-Access Network”, Dodalingappa-Nagarathna, P., lead advisor: Prasad Calyam, co-advisor: Jay Ramanathan, May 2013.
100. “Where to Eat: Location-Based Mobile App for Android Platform”, Zhao, G., co-advisor: Steven Bibyk, May 2013.
101. “Multi-touch Gesture Recognition”, Gunturi, A., co-advisor: Steven Bibyk, Spring 2013.
102. “An Image Analysis of Indoor Self-Localization”, Palaniswamy, B., co-advisor: Jay Ramanathan, December, 2012.
103. “Project Report: A Detailed Summary of Projects Done at The Ohio State University Health Plan Inc. (OSUHP)”, Patil, R., December 2012.
104. “Project Report: Memory Access Characterization of TinyOS Applications on TOSSIM”, Rudramuni, C, co-advisor: Anish Arora, co-advisor: Jay Ramanathan, December 2012.
105. “Openflow Controller Design and Implementation”, Zhang, D., lead advisor: Prasad Calyam, co-advisor: Jay Ramanathan, December 2012.
106. “FSS Cash Reconciliation System Enhancement Project”, Surana, A., June 2012.
107. “PFast Secondary Development and its Application”, Wang, M., lead advisor: Irani, S., June 2012.
108. “Low-Cost Targeting System”, Chima, K., co-advisor: Jay Ramanathan, Spring 2012.
109. “3D Gesture Recognition using Hidden Markov Models”, Manuru, H, lead advisor: Bibyk, S., March 2012.
110. “Face Recognition For An Open World Spoken Dialog System”, Vasudevan, R, lead advisor: Bibyk, S., March 2012.

111. "Person tracking using Kalman Filtering", Sasidharan, A., lead advisor: Bibyk, S., March 2012.

**Undergraduate Honors Theses Advised and Co-Advised:**

1. "Computational Measurements of Retinal Nerve Fiber Bundles", Weible, J., co-advisors: Choi, S., Doble, N., May 2022
2. "Relational Databases and SQL", Shen, J., co-advisor Thomas Bihari, May 2020.
3. "The Development and Effect of Serious Games", Burl, D., co-advisor Ramanathan, J., May 2013.
4. "Connecting People and Events: Multi-Modal Routing and Dynamic User-Generated Content", Chawla, P., lead advisor Sivilotti, P., June 2009.
5. "Song Identification Using the Numenta Platform for Intelligent Computing," Schey, N., co-advisor Belkin, M., May 2008.
6. "A Mobile Real Time Data Collection and Analysis System for Farm Management," Larusso, N., co-advisor Boyles, S., May 2006

**Technical Reports:**

1. "Human Computation Recommender for Inter-Enterprise Data Sharing and ETL Processes", Michael J. Herold, Satyajeet Raje, Jay Ramanathan, Rajiv Ramnath, and Zhe Xu, OSU-CISRC-5/12-TR08
2. "Agent-managed Interaction Recommendation for Effective Large-Scale Collaboration", Xu Zhe, Jay Ramanathan, Rajiv Ramnath, OSU-CISRC-5/12-TR07
3. "Deriving Service Principles Relating Lean in-the-large Systems to Autonomous in-the-small Entities," Jay Ramanathan, Rajiv Ramnath, and Randall Glassgow, 13 pp. OSU-CISRC-5/07-TR37.
4. "Practice Relevant Pedagogy for Mining Software Engineering Curricula Assets," Rajiv Ramnath, Jay Ramanathan, and Umesh Bellur, 25 pp. OSU-CISRC-5/07-TR36.
5. "Using the NFR Framework in the context of the Balanced Scorecard: The Strategic Engineering of Public IT," Rajiv Ramnath, Anand Desai, Paul Carlson, 7 pp. OSU-CISRC- 11/06-TR78. Electronic report under 2006/TR78.pdf OSU-CISRC-11/06--TR78
6. "Enterprise Capacity Management -- Assessment of Related Best Practices and Research", Jay Ramanathan, Rajiv Ramnath, Chris Newland, John Northland, Jason McKittrick, Aaron C. Roberts, Brett Gerke, Joe Bolinger, and John Pan.. Sponsored by Nationwide Insurance. 29 pp. ed. Columbus. (Report No. OSU-CISRC-5/07-TR38, Jan 2007). <ftp://ftp.cse.ohio-state.edu/pub/tech-report/2007/TR38.pdf>. (Published).
7. "Using XML as a Work Management command language," Rajiv Ramnath, Charles E. Meier and Venugopal Vasudevan, Concentus Technical Report and SBIR Phase 1 Proposal to the National Institute of Standards, January 1999.
8. "Work Fabrics – Matching and Managing Vendors and Suppliers in Internet-based E-Commerce," Rajiv Ramnath, Charles E. Meier and Venugopal Vasudevan – Concentus Technical Report and Proposal for the 1999 NIST ATP Competition, February 1999.
9. "Using an Active Database to Integrate a Parallel Programming Environment," Rajiv Ramnath, Karsten Schwan, OSU Technical Report, OSU-CISRC-5/88-TR16, 1988.

**Courses Taught:**

1. Research Intensive Capstone (CSE 5916): application of research methods and best practices in research; teamwork, written and oral communication. The objective of this course is to provide an intensive research experience for students at all levels.
2. Requirements Analysis (CSE 5232): Information systems analysis; object-oriented analysis models and tools; use cases, system modeling using UML; requirements specification development; term project.

3. Distributed Enterprise Computing (CSE 5234): Course description: Characteristics, and functional and non-functional requirements of large-scale enterprise systems. The technologies used in enterprise systems. Application of XML toolkits, AJAX, Enterprise Java (Enterprise Java Beans, Java Server Faces and Java Server Pages), the Google Web Toolkit and the Enterprise Services Bus, to build elements of an enterprise scale application. Also course coordinator.
4. Mobile Application Development (CSE 5236): Course description: Mobile application development frameworks; Architecture, design and engineering issues, techniques, and methodologies for mobile application development. Also course coordinator.
5. Research Topics in Enterprise Architectures and Systems and CETI Colloquium.
6. Systems Software (CSE 560): This is the “keystone” course in the CSE undergraduate program. Learning outcomes are an understanding of (a) systems software, (b) software design, implementation and testing (c) team-working (d) professional writing. 2002-2005.
7. Software Engineering (CSE 5231): Learning outcomes are: understanding of frameworks – i.e. tools, techniques and processes for (a) the business context of enterprise software engineering (b) the software development lifecycle, (c) enterprise software architecture (d) software project management (e) enterprise software design, (f) infrastructure management of enterprise systems. Also course coordinator.
8. Software Engineering Capstone (CSE 5911): Students applied the tools and techniques learned in their CSE program in the context of an industry-sponsored enterprise-scale project.

**Research and Development Projects (note: some projects span multiple years):**

2017:

1. Let's BRAG (Bring Robust Achievement Gains) about our Schools!, Delphos City Schools. Team: Missy McClurg (Delphos City Schools), OntoBorn Inc. (external consultant), Rajiv Ramnath.
2. Nationwide Insurance, Telematics Insights, Team: Sobhan Moosavi, Rajiv Ramnath
3. Astute Technologies: Research in Data Mining and Information Retrieval. Team: Renhao Cui, Gagan Agrawal, Rajiv Ramnath

2016:

4. Let's BRAG (Bring Robust Achievement Gains) about our Schools!, Delphos City Schools. Team: Missy McClurg (Delphos City Schools), OntoBorn Inc. (external consultant), Rajiv Ramnath.
5. Nationwide Insurance, Telematics Insights, Team: Sobhan Moosavi, Rajiv Ramnath
6. Astute Technologies: Research in Data Mining and Information Retrieval. Team: Renhao Cui, Gagan Agrawal, Rajiv Ramnath
7. Honda: Bluetooth-based positioning system, Team: Gopi Tummalla, Derrick Cobb (Honda), Prasun Sinha, Rajiv Ramnath

2015:

8. Sentosa Tech, Utoqa: Research in persuasive systems. Team: Naveenraj, Nagarithnam, Neha Choudhary, Rajiv Ramnath.
9. OCLC: Indexing and ranking open-access journals. Team: Shashank Agrawal, Andrew Yates, Manirupa Das, Rajiv Ramnath.
10. Institute of Education Sciences: Computer-aided reduction of special education/reading risk through a voice-recognition-based oral reading fluency intervention for urban learners. Team: Tom Lynch, Jessica Bennett, Morris Council, DeLayna Green, Gwendolyn Cartledge, Ralph Gardner, Rajiv Ramnath.
11. Columbus Dispatch: Data driven trend and demand analysis from server logs and clickstream data. Team: Manirupa Das, Arnab Nandi, Rajiv Ramnath.

12. Astute Technologies: Research in Data Mining and Information Retrieval. Team: Renhao Cui, Gagan Agrawal, Rajiv Ramnath
13. Honda: Bluetooth-based positioning system, Team: Gopi Tummalla, Derrick Cobb (Honda), Prasun Sinha, Rajiv Ramnath
14. EdGeo, Vector Arithmetic STEM Apps. Team: Brendon Mikula, Krishna Tumulapalli, Sivashankari Ganesan, Niveda Kalaiselvan, Ajay Kuriakose, Dean Cristol, Andrew Heckler, Rajiv Ramnath.

## 2014:

1. OCLC: Indexing and ranking open-access journals. Team: Andrew Yates, Shashank Agrawal, Ravi Kumar, Rajiv Ramnath.
2. Columbus Dispatch: Data driven trend and demand analysis from server logs and clickstream data. Team: Manirupa Das, Arnab Nandi, Rajiv Ramnath.
3. Institute of Education Sciences: Computer-aided reduction of special education/reading risk through a voice-recognition-based oral reading fluency intervention for urban learners. Team: Tom Lynch, Jessica Bennett, Morris Council, DeLayna Green, Gwendolyn Cartledge, Ralph Gardner, Rajiv Ramnath.
4. US Army: Web-based applications for STI prevention education delivery methods for military women. Team: Zhaoyi Chen, Maria Palazzi, Victoria vonSadowski, Rajiv Ramnath.
5. National Science Foundation: GeoGame, an online gaming environment for raising student awareness in geography. Team: Zhaoyi Chen, Brendon Mikula, Peixuan Chen, James Baginski, Ola Ahlqvist, Andrew Heckler, Rajiv Ramnath.
6. EdGeo, Vector Arithmetic STEM Apps. Team: Brendon Mikula, Krishna Tumulapalli, Sivashankari Ganesan, Niveda Kalaiselvan, Ajay Kuriakose, Dean Cristol, Andrew Heckler, Rajiv Ramnath.
7. Minimally invasive indoor location. Team: Branai Ramu, Sham Dorairaj, Rajiv Ramnath.

## 2013:

1. Institute of Education Sciences: Computer-aided reduction of special education/reading risk through a voice-recognition-based oral reading fluency intervention for urban learners. Team: Tom Lynch, Atreya Srivathsan, Jessica Bennett, Gwendolyn Cartledge, Rajiv Ramnath.
2. Ohio Department of Health: Apps for Asthma: Persuasive mobile applications for asthma prevention in young adults, Team: Hyunjeong Yoo, Heesung Lee, Aditya Prabhune, Michael Herold, Rajiv Ramnath.
3. US Army: Web-based applications for STI prevention education delivery methods for military women. Team: Saranyadevi Ganesan, Michael Herold, Rajiv Ramnath.
4. National Science Foundation: GeoGame, an online gaming environment for raising student awareness in geography. Team: Ola Ahlqvist, Andrew Heckler, Kathryn Plank (2011-2012), Rohan Benkar, Kiril Vatev, Rajiv Ramnath.
5. Yale University: HeartStudy: a survey- and data-analysis system to study recovery and other outcomes from cardiac arrest events. Team: Rajiv Ramnath.
6. MicroIndustries Inc.: Framework for gesture-based applications. Team: Aditi Singhal, Anoop Gunturi, Thomas Lynch, Steve Bibyk, Rajiv Ramnath.
7. Ohio Supercomputer Center: Integrated architecture for rapid portal development and rollout. Team: David Hudak, Thomas Bitterman, Yixue Li, Piyush Dewan, Rajiv Ramnath.
8. Samraksh Inc.: Analysis of Flash-based memory models for resource-constrained devices. Team: Ananth Mahadevan Muralidharan, Rajiv Ramnath.

9. Samraksh Inc.: Using wavelet transform based micro-Doppler signal processing for object recognition. Team: Vinit Kizhakkal, Rajiv Ramnath.
10. OCLC: Automating library inventory management using multi-modal techniques - image-processing, optical character recognition and information retrieval techniques. Team: Sudheer Tumu, Rajiv Ramnath.

2012:

1. Samraksh Inc.: Analysis of Flash-based memory models for resource-constrained devices. Team: Ananth Mahadevan Muralidharan, Chethan Rudramuni, Rajiv Ramnath.
2. Samraksh Inc.: Using wavelet transform based micro-Doppler signal processing for object recognition. Team: Vinit Kizhakkal, Rajiv Ramnath.
3. Institute of Education Sciences: Computer-aided reduction of special education/reading risk through a voice-recognition-based oral reading fluency intervention for urban learners. Team: Tom Lynch, Atreya Srivathsan, Gwendolyn Cartledge, Rajiv Ramnath.
4. Ohio Department of Health: Persuasive mobile applications for asthma prevention in young adults, Team: Heesung Lee, Aditya Prabhune, Michael Herold.
5. US Army: Web-based applications for STI prevention education delivery methods for military women. Team: Saranyadevi Ganesan, Michael Herold.
6. Nationwide Insurance: Effective Agile development practices, Team: Rachit Sood, Abhijit Shirke, Ritu Singh, Alhad Sapre, Jay Ramanathan, Rajiv Ramnath.
7. JPMorgan Chase: Enterprise Architecture Evaluation of High-Transaction Systems: Subha Balaraman, Rajiv Ramnath.
8. Institute for Sensing Systems, The Ohio State University: iBrutus, and open-world, spoken dialog system. Team: Thomas Lynch, Hareendra Manuru, Ashok Sasidharan, Rajagopal Vasudevan, Seth Darbyshire, Rajiv Ramnath.
9. The Ohio State University Office of Student Life: SHIFT, a P4 Wellness application for college campuses. Team: Michael Herold, Shweta Kulkarni, Saranya Devi, Rajiv Ramnath. Project terminated after initiation phase.
10. National Science Foundation: GeoGame, an online gaming environment for raising student awareness in geography. Team: Ola Ahlqvist, Kathryn Plank, Andrew Heckler, Rohan Benkar, Kiril Vatev, Rajiv Ramnath.
11. Yale University: HeartStudy: a survey- and data-analysis system to study recovery and other outcomes from cardiac arrest events. Team: Jithendra Rangaraj, Thomas Lynch, Abhijit Shirke, Rajiv Ramnath.
12. Tony Wells Foundation: SeeSharp, a music player for musicians with visual impairments. Team: Peter Rogers, Carrie Phillips, Laura Housley, Rajiv Ramnath.
13. OSU Medical Center: Portals for semantic search. Team: Po-Yin Yang, Omkar Lele, Ankush Srivastava, Satyajeet Raje, Jay Ramanathan, Rajiv Ramnath.
14. Ohio Supercomputer Center: Integrated architecture for rapid portal development and rollout. Team: David Hudak, Thomas Bitterman, Da Zhang, Da Cai, Yixue Li, Piyush Dewan, Rajiv Ramnath.
15. Ohio Supercomputer Center: Monitoring, management and resource allocation for clouds. Team: Aishwarya Venkatraman, Manojprasad Dhanapalan, Prasad Calyam, Rajiv Ramnath.
16. NSF GENI: BAK-PAK, sensor based educational toolkits for STEM. Team: Anish Arora, Michael McGrath, Wenjie Zeng, Rajiv Ramnath.

2011:

1. Institute for Sensing Systems, The Ohio State University: iShoe, an integrated suite of mobile applications for an enhanced stadium experience. Team: Thomas Lynch, Chris Dean, Arathi Mani, Brian Alberta, Adam Zink, Rajiv Ramnath.

2. Ohio Board of Regents: Mobile eReader and browser for subjects with visual impairments. Team: Carolyn Sommerich, Sanghyun Park, Steve Jacobs (IDEAL Group), Hyunjeong Yoo, Christopher Fenner.
3. Samraksh Inc.: Implementing the .NET micro-framework on a sensor platform, tools for integration of sensor platforms with the cloud. Team: Nived Sivasdas, Karthik Natarajan, Rajiv Ramnath.
4. Ohio Supercomputer Center: Integrated architecture for rapid portal development and rollout. Team: David Hudak, Thomas Bitterman, Changpil Lee, Arun Chockalingam, Rajiv Ramnath.
5. TechColumbus,1492 Program: myLee, integrated calendaring. Team: Joe Bolinger, Shweta Deshpande, Rajiv Ramnath.

2010:

1. Nationwide Insurance: Enterprise Architecture Evaluation for Document Management. Team: Rajiv Ramnath, Jay Ramanathan, Jaspreet Oberoi, Shweta Deshpande, Anand Bernard-Selvaraj.
2. Abercrombie and Fitch Inc., The Gap Inc. and Thoughtworks Inc.: Projects around deployment of Agile practices within organizations, Agile education and training. Team: Rajiv Ramnath, Jay Ramanathan, Aman Kumar, Oleg Mischenko, Vineet Harbhajanka.
3. Ohio Department of Job and Family Services, Enterprise and Organizational Architecture Evaluation. Team: Rajiv Ramnath, Jay Ramanathan, Praveen Nagarajan, Roshni Datta.
4. Brulant Inc.: Portable application development for Smartphones. Team: Jay Ramanathan, Rajiv Ramnath, Neeraj Gupta, Yuri Shelke, Avijeet Sahoo.
5. Strategic Thinking Industries: Developing customized integration of health care services using an enterprise service bus. Team: Rajiv Ramnath, Jay Ramanathan, Ketaki Koppal, Rahul Mukhedkar.
6. Business Higher Education Forum, Systems Dynamic Framework for STEM education. Team: Jay Ramanathan, Rajiv Ramnath, Shubhanan Deshpande, Joseph Fiksel, Kathy Sullivan.
7. Ohio Department of Health: Evaluation of Pandemic Flu contingency plans and training, Rajiv Ramnath, Anand Desai
8. Nationwide Insurance, the Ohio Supercomputer Center and OSU Office of Information Technology: Green Data Centers. Team: Rajiv Ramnath, Jay Ramanathan, Ralston DaSilva, Michael Green, Rajesh Nandagiri.
9. City of Columbus: E-Government Portal Systems Analysis Framework, Jay Ramanathan, Ola Ahlqvist, Rajiv Ramnath, Kelly Yackovich, Vasudha Gupta, Farha Mukri, Shubhanan Deshpande, Thomas Loffing.

2009:

1. TDCI Inc.: Hybrid configuration. Rajiv Ramnath, Jay Ramanathan, Vasudha Gupta, Nisheet Singh

2008:

1. Nationwide Insurance: Framework for evaluating collaborative technologies. Team: Jay Ramanathan, Rajiv Ramnath, Joe Bolinger, and Gregory Horvath.
2. OSC: Effective software development processes for supercomputing cyberinfrastructures. Team: Rajiv Ramnath, Tom Lynch.
3. Ecelucom: Evaluating software and organizational architecture using ATAM and ACE. Team: Rajiv Ramnath, Farha Mukri, Aman Kumar.
4. Ontology Works Inc., and Matt Wald Consulting: Commercialization evaluation of ontology-based information retrieval technology. Team: Jay Ramanathan, Rajiv Ramnath, Joe Bolinger.



5. SID: Re-architecture of the Ohio State University Course Integration Platform. Team: Rajiv Ramnath, Aaron Roberts, Kelly Yackovich.

2007:

1. City of Columbus: Evaluation for the Department of Justice of the City's 3-1-1 system for use in crises-management situations. Team: Rajiv Ramnath, Anand Desai, Jay Ramanathan.
2. McGraw-Hill Education: Enterprise Architecture Pattern Mining. Team: Jay Ramanathan, Rajiv Ramnath, Joe Bolinger, Jared Zelek.

2006:

1. City of Columbus: Independent Validation and Verification of the City's 3-1-1 architecture. Team: Rajiv Ramnath, Yevgeniy Razevayev, John Coursen.

2005:

1. DARPA: Deployment and experimentation with the ExScal extreme-scale sensor network. Anish Arora, Rajiv Ramnath, 15 students.
2. Kansei: Development and deployment of the Kansei testbed for sensing at scale.

2004:

1. City of Columbus, Department of Technology, Information Technology Strategic Plan. Team: Rajiv Ramnath, Jay Ramanathan.
2. Central Ohio Transit Authority, Services Architecture Validation. Team: Rajiv Ramnath, Bettina Bair.

2003:

1. Migration Technologies, Legacy to three-tier migration.. Team: Rajiv Ramnath, Brian Adams, Rameez Rana.

#### **Software Systems Implemented:**

- 2013: GeoGame: Geogame is a .NET based cyber-game for teaching spatial and geographical concepts.
- 2013: SMART: SMART is a .NET-based framework for storyboard-like web education applications. SMART is currently being used to deliver behavioral education to women in the U.S. military.
- 2013: Apps for Asthma: Apps for Asthma is a cross-platform Titanium-based framework for health-related mobile applications.
- 2013: GeoGame: GeoGame is a web-based geospatial educational game framework for developing on-line games that have a Geography focus.
- 2012: SeeSharp: SeeSharp is an Android music reader application for visually impaired musicians.
- 2010: iShoe: iShoe is an stadium-centric "infotainment" iPhone as well as web application.
- 2009: MetaDB: MetaDB is a J2EE-based system for metadata based data management. The first release of MetaDB (implemented through a Masters' Thesis project) provides tag-based meta-data specification, and role-based access control. 2010.
- 2007: Ignis: Ignis is an Eclipse-based agent-based simulation framework. The first release of Ignis (implemented through a Masters' Thesis project) provides an agent and event framework, mobility models and simple visualization capabilities. 2007.
- 2007: Psife: Psife is an Eclipse-based environment for integrating manufacturing-planning and optimization tools. The first release of Psife (implemented through a Masters' Thesis project) provides an integrating offering of the PFAST suite of facility planning tools. 2006.
- 2006: Kansei: Kansei is an indoor sensor-network testbed consisting of multiple mote-scale devices and gateway devices, and provides an infrastructure for at-scale experimentation on

sensor networks. It was initially conceived to test the middleware services for the Tier-2 network of the Extreme Scale (ExScal) project funded by DARPA.

- 1999: JD150: JD150 was developed for Concentus Technology Corp. as part of the NIIP initiative (see above). JD150 is an XML-based lightweight WfMC standards-compliant workflow engine. JD150 has a footprint less than 50KB and is designed to be a workflow engine embeddable in pervasive devices. JD150 is also jointly licensed by IBM Corp. (also as part of the NIIP Consortium) and supported a set of workflow applications for the chip-manufacturing and shipbuilding industries. 2001.
- 1998: WorkBridge: WorkBridge was developed for Concentus Technology Corp. as part of its workflow product suite. WorkBridge is layered on the MetaExpress workflow engine (see below) and extended MetaExpress to provide (a) a CORBA-compliant OMG standards-compliant workflow toolkit and (b) a Web-based workflow application. 1998.
- 1996: MetaExpress: MetaExpress was developed for Concentus Technology Corp. as part of its workflow product suite, and jointly licensed as Optegra Workflow to ComputerVision Inc. as part of their Optegra suite of engineering support products. MetaExpress consists of an extensible workflow engine and a general-purpose client-server workflow application. 1996.
- 1989: KI-Shell: KI Shell was developed for UES Inc. as an engineering workflow framework. Major KI Shell deployments were at Washington Mutual Bank (\$1.2M in license revenue), Caterpillar Inc. (\$600,000 in license revenue). 1990.

### **Research Funding:**

1. 2024: NetJets Inc., Fleet bidding incentive design informed by simulation and game theory for pilot training and career paths PI: Sam Davanloo, co-investigators: Theodore Allen. \$215,787.
2. 2022-2023: OSU, An Integrated Data CyberInfrastructure to Accelerate Research in Mobility, Health and Environmental Justice, co-PI: Huyen Le, Andrew May, 07/01/22-06/30/23, TDAI and Sustainability Institute Interdisciplinary Research Scaling Grant. \$15,000.
3. 2022-2023: OSU, Leveraging Artificial Intelligence to Accelerate Life-Saving 911 Care, PI: Wang, Henry, co-Investigators Ashish Panchal, Travis Sharkey-Toppen, Rajiv Ramnath, 07/01/2022-06/30/2023, <https://erik.osu.edu/story/mar22-pre-acceleratorgrants>, \$50,000.
4. 2022-2024: CARES Act – Governor’s emergency education relief (GEER) fund for Ohio Higher Ed - broadband and 5G sector partnership grant, PI: Anish Arora, co-PI: Correia, Ana-Paula, Cristol, Dean Stuart, Ekici, Eylem, Lepicki, Traci L, Maurer, Julie A, Ramnath, Rajiv, 01/12/2022 - 09/30/2023, \$4,017,728.
5. 2021-2023: CyberTraining: Pilot: An Artificial Intelligence Bootcamp for Cyberinfrastructure Professionals, PI: Karen Tomko co-PI: Cahill, Katherine, Fosler-Lussier, Eric, Machiraju, Raghu, Panda, Dhableswar, 09/01/2021-09/01/2023, \$299,998.
6. 2021-2026: National Science Foundation, AI institute for intelligent cyberinfrastructure with computational learning in the environment (ICICLE), PI: D.K. Panda, co-PI: Berger-Wolf, Tanya, Blanas, Spyros, Cai, Yongyang, Chao, Wei-Lun, Fosler-Lussier, Eric, Hyder, Ayaz, Machiraju, Raghu, Ramnath, Rajiv, Shearer, Scott Allan, Shen, Han-Wei, Stewart, Christopher Charles, Su, Yu, Sun, Huan Tomko, Karen A, 11/01/2021 - 10/31/2026, \$20,000,000.
7. 2021-2021: Astute Solutions, Information retrieval techniques for social customer relationship management (CRM) systems, 01/01/2021- 12/31/2021, PI: Ramnath, \$81,593
8. 2020-2021: OSU, Establishing Research Pre-Eminence and Transformative Broader Impact and Participation in Extreme-Scale, Intelligent Human-Machine Systems for Image-Driven Medicine, 08/01/2020 – 06/01/2021, PI: Rajiv Ramnath, co-PI: Jian Chen, Eric Fosler-Lussier, Raghu Machiraju, Arnab Nandi, D.K. Panda, Srini Parthasarathy, Hari Subramoni,

- Nathan Doble, Dean Vannasdale, Anil Parwani, Translational Data Analytics Seed Grant, \$46,000.
9. 2020-2023: National Science Foundation, RI: Small: Early elementary reading verification in challenging acoustic environments, 08/01/2020 - 07/31/2023, PI: Eric Fosler-Lussier, co-PI Ramnath, Laura Wagner, \$450,000.
  10. 2020-2025: MRI: RADiCAL: Reconfigurable Major Research Cyberinfrastructure for Advanced Computational Data Analytics and Machine Learning, 10/01/2020-09/30/2023, PI: D.K. Panda, Co-PI: Ramnath, Parthasarathy, Parwani, Machiraju, \$770,000.
  11. 2020-2022: National Science Foundation, CC\*: Integration-Large: POWWOW: Software-defined infrastructure for wireless, edge cybersecurity testbeds, 10/01/2020 - 09/30/2022, PI: Anish Arora, Co-PI: Rajiv Ramnath, Kannan Athreya, \$749,968.
  12. 2020-2021: National Science Foundation, EAGER: Bridging the last mile; Towards an assistive cyberinfrastructure for accelerating computationally driven science, 01/01/2020 - 12/31/2021, PI: Rajiv Ramnath, co-PI: Jian Chen, Bryan Carstens, \$299,687.
  13. 2020-2020: National Science Foundation, SHF: Small: Techniques and frameworks for exploiting recent SIMD architectural advances, 07/01/2015- 06/30/2020, PI: Ramnath, \$449,999 (took over as PI from Dr. Gagan Agrawal).
  14. 2020-2021: Accelerating system capabilities of the Ohio innovation exchange to advance discovery, State of Ohio, subcontract from Ohio University, 01/20/2020-06/30/2021 PI: Rajiv Ramnath co-PI Leon Madrid, Jeffrey Agnoli, \$168,940.85
  15. 2020-2020: Astute Solutions, Information retrieval techniques for social customer relationship management (CRM) systems, 01/01/2020- 12/31/2020, PI: Ramnath, \$127,143.
  16. 2019-2024: National Science Foundation, NSF-NRT-HDR: Convergent Graduate Training and EmPOWERment for a Sustainable Energy Future," PI: Sioshansi, Co-PI: Ramnath, Irwin, Mayhew, Bielicki, \$2,980,383
  17. 2019-2021: National Science Foundation, EAGER: A framework for economical cyber security inspection and assurance, 03/15/2019 - 02/28/2021, PI: Allen, Co-PI: Ramnath, \$300,000
  18. 2019-2019: Nationwide Insurance, Integrating telematics data with other data sources to develop models of driver risk 01/01/2019- 12/31/2019, PI: Ramnath, \$55,313
  19. 2019-2019: Astute Solutions, Information retrieval techniques for social customer relationship management (CRM) systems, 01/01/2019- 12/31/2019, PI: Ramnath, \$122,398
  20. 2019-2019: Safe Auto Group Agency, Inc. Analyzing call center voice communications for business insights 0/501/2019- 05/01/2020, PI: Ramnath, \$59,639
  21. 2018-2018: Integrating telematics data with other data sources to develop models of driver risk, Nationwide Insurance, \$60,881.
  22. 2018-2018: Information retrieval techniques for social customer relationship management (CRM) systems, Astute Solutions, \$54,431 (co-PI: Gagan Agrawal)
  23. 2017-2018: Improving service quality with translational data analytics, Haier Group, \$15,000
  24. 2017-2017: Integrating telematics data with other data sources to develop models of driver risk, Nationwide Insurance, \$47,746.
  25. 2017-2017: Information retrieval techniques for social customer relationship management (CRM) systems, Astute Solutions, \$47,746 (co-PI: Gagan Agrawal)
  26. 2016-2016: Integrating telematics data with other data sources to develop models of driver risk, Nationwide Insurance, \$54,740
  27. 2015-2018, Intergovernmental Personnel Act Appointment, National Science Foundation, \$649,334.
  28. 2016-2016: Information retrieval techniques for social customer relationship management (CRM) systems, Astute Solutions, \$45,141 (co-PI: Gagan Agrawal)

29. 2015-2018: Bridging the gap in e-capacity for global health research and training in eastern Africa, John E Fogarty International Center, \$215,754 (PI: Gebreyes, Co-PIs: Bisesi, Gorgas, Menon, Schopis, Xiao)
30. 2015-2016: Help Desk Service Improvement, Nationwide Insurance, \$55,000 (co-PI Jay Ramanathan)
31. 2015-2016: Integrating telematics data with other data sources to develop models of driver risk, Nationwide Insurance, \$55,000 (co-PI Jay Ramanathan)
32. 2015-2016: Information retrieval techniques for social customer relationship management (CRM) systems, Astute Technologies, \$42,000 (co-PIs Gagan Agrawal, Jay Ramanathan)
33. 2014-2015: Bluetooth and wifi proximity and positioning study, Honda of America, \$35,693 (co-PI Prasun Sinha)
34. 2014-2015: Introduction to Java for the non-Java programmer, Nationwide Insurance, \$33,000 (co-PI Jeremy Morris).
35. 2014-2014: Data and analytics R&D in telematics, Nationwide Insurance, \$54,000. (PI: Jay Ramanathan)
36. 2014-2017: NSF-SBE: TTP Option: Medium: Data-Driven Cyber Vulnerability Maintenance, \$632,297 (PI: Theodore Allen)
37. 2014-2018: Let's BRAG (Bring Robust Achievement Gains) about our Schools!, Delphos City Schools, Subcontract to State of Ohio Straight-A grant, \$154,589 (includes \$15,000 add on in 2016). On no-cost-extension through 2018.
38. 2013-2014: Evaluating quality of open access journals, OCLC Inc., \$45,000.
39. 2014-2014: Research in Data Mining and Information Retrieval, Astute Technologies, \$42,000.
40. 2013-2014: EXP: GeoGames - online map games for teaching and learning through a real-world spatial perspective, \$249,999. (PI: Ola Ahlqvist)
41. 2013-2014: Information retrieval tools for gathering insights from help desk information, Nationwide Insurance, \$52,000 (PI: Jay Ramanathan).
42. 2013-2014: Data mining, information retrieval from unstructured data streams, Nationwide Insurance, \$200,000.
43. 2012-2013: Enterprise Architecture Research, NSF IUCRC-supported project, Nationwide Insurance, \$100,000.
44. 2012-2013: Enterprise Architecture Research, NSF IUCRC-supported project, CloudMaarg Inc., \$14,500. Unrestricted Gift.
45. 2012-2015: Reducing special education/reading risk through an oral reading fluency intervention for urban learners, \$479,053.
46. 2012-2013: Mobile Applications and Application Framework for Asthma Prevention, Ohio Department of Health, \$48,000.
47. 2012-2013: Enterprise Architecture Research, NSF IUCRC-supported project, OCLC, \$45,000.
48. 2012-2013: Enterprise Architecture Research, NSF IUCRC-supported project, Ohio State University Medical Center, \$25,000. (PI: Jay Ramanathan)
49. 2012-2013: Enterprise Architecture Research, NSF IUCRC-supported project, Samraksh Inc., \$44,500.
50. 2012-2015: Effectiveness and benefit of two STI prevention delivery methods for military women, Sponsor: Uniformed Services University Health Sciences, \$660,959.00. (PI: Maria Palazzi)
51. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, Astute Technologies, \$27,000.

52. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, Nationwide Insurance, \$69,000.
53. 2011-2012: Capstone Sponsorships (Lexmark, Eaton Corp., Cardinal Industries, Transmap, Haugland Learning Centers and other sponsors), \$30,500.
54. 2011-2012: IBM Shared University Research Award (Equipment Grant) \$22,035 (estimated value).
55. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, JP Morgan Chase, \$32,000.
56. 2011-2013: EXP: GeoGames - A virtual simulation workbench for teaching and learning through a real-world spatial perspective, Sponsor: NSF Social, Behavioral & Economic Res (35000801): IIS-1124037, \$349,114. (PI: Ola Ahlqvist)
57. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, Ohio State University Medical Center, \$42,000.
58. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, Samraksh Inc., \$28,000.
59. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, Ohio Supercomputer Center, \$57,000.
60. 2011-2011: IDEAL Group. Gift, \$5000.
61. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, Micro Industries, \$45,000.
62. 2011-2012: Enterprise Architecture Research, NSF IUCRC-supported project, Astute Technologies, \$21,000. Provided as unrestricted gift.
63. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Songwhale Inc., \$19,000.
64. 2010-2011: Open-Source Talking eBook Reader, OH Rehabilitation Services Commission, \$65,443. .
65. 2010-2011: Accessible Mobile Web Browser, OH Rehabilitation Services Commission, \$65,443.
66. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Nationwide Insurance, \$45,000.
67. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Ohio Supercomputer Center, \$18,000.
68. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Samraksh Inc., \$42,000.
69. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Ohio Supercomputer Center, \$36,000.
70. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Grange Insurance, \$24,000.
71. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Juice Technologies, \$13,200.
72. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Cable Television Labs Inc., \$5,591.
73. 2010-2011: Enterprise Architecture Research, NSF IUCRC-supported project, Nationwide Inc., \$45,000.
74. 2009-2010: Enterprise Architecture Research, NSF IUCRC-supported project, TechColumbus 1492 Program, \$12,470.
75. 2009-2009: SentosaTech Inc. Gift, \$1000.
76. 2009-2009: Pandemic influenza program initiative B-project 6 program: Addressing vulnerabilities in populations, \$30,000, (PI: Anand Desai).

77. 2008-2011: GENI-fying and Federating Autonomous Kansei Wireless Sensor Networks, BBN Technologies, \$166,667 (first year funding) (PI: Anish Arora).
78. 2009-2011: Curriculum for Accelerated Services Engineering (CASE), NSF Program: Course, Curriculum and Laboratory Improvement Program: Phase 1 (Exploratory Projects), \$149,981, (co-PI: Jay Ramanathan, Neelam Soundarajan, Jerome D'Agostino).
79. 2008-2009: Evaluating Feasibility of the Distribution and Dispensing of Antiviral Drugs to Self-Isolated or Self-Quarantined Persons as Part of a Community Containment Strategy in Ohio, Cuyahoga County Board District of Health, \$20,000. (PI: Anand Desai).
80. 2008-2009: Business Higher Education Forum (BHEF), STEM Modeling and Management Project, \$61,942. (PI: Kathy Sullivan, Glenn Institute of Public Affairs).
81. 2008-2009: Enterprise Architecture Research, NSF IUCRC-supported project, Context Knowledge Group LLC, \$5,000.
82. 2007-2008: Enterprise Architecture Research, NSF IUCRC-supported project, TDCI Inc., \$6634.
83. 2007-2008: Enterprise Architecture Research, NSF IUCRC-supported project, TDCI Inc., \$11,000. Provided as gift.
84. 2007-2008: Enterprise Architecture Research, NSF IUCRC-supported project, ST Industries, \$16,000.
85. 2008-2009: Enterprise Architecture Research, NSF IUCRC-supported project, Nationwide Insurance, \$45,000. (Co-PI Jay Ramanathan)
86. 2008-2013: Center for Experimental Research in Computer Systems - Research Site Ohio State University, \$250,000.00. (PI Jay Ramanathan)
87. 2008-2009: Training of Public Health Personnel and Public Health Partners in the "Planning P Process" for a Type 3 Incident, \$108,228.12. (PI: Anand Desai)
88. 2008-2009: Enterprise Architecture Research, NSF IUCRC-supported project, Ohio Department of Job and Family Services, \$45,000. (Co-PI Jay Ramanathan)
89. 2008-2009: Bringing the crowds to the battleground: How newsrooms can deepen and improve their election coverage by involving citizens and using open-source analysis tools. Battelle Endowment for Technology and Human Affairs (BETHA) Grant. \$56,285. Role: Co-PI (PI: Trevor Brown, John Glenn School for Public Affairs).
90. 2008-2009: NSF CI-Team: Improving American Competitiveness through Workforce Education in Cyberinfrastructure Applications. Role: Senior Personnel. \$999,942. Role: Senior Personnel (PI: Steven Gordon, Ohio Supercomputer Center).
91. 2007-2008: IBM Shared University Research Award (Equipment Grant). \$85,398 (estimated).
92. 2007-2008: Enterprise Architecture Research, NSF IUCRC-supported project, Nationwide Insurance, \$45,000. (Co-PI Jay Ramanathan)
93. 2007-2008: Enterprise Architecture Research, NSF IUCRC-supported project, City of Columbus, \$50,000. (PI Jay Ramanathan)
94. 2007-2012: NSF Creative Pathways to Undergraduate Education (CPATH): Nurturing through Entrepreneurship IT World Leaders (NEWPATH). National Science Foundation Grant #0722287. \$539,000. (PI: David Lee)
95. 2007-2008: Enterprise Systems Workshops for the Securities Exchange of China. , curriculum development, instruction and coordination. (Other instructors and collaborators: Jay Ramanathan, Greg Hines. Coordination through Fisher College of Business, Department of Executive Education.)
96. 2006-2008: SID: Re-architecture of the Ohio State University Integration Platform. NSF IUCRC-supported project, Ohio State University, Office of Information Technology, \$47,500.

97. 2007-2013: Acute coronary syndrome and care-seeking delay: a web based behavioral study, National Heart, Lung, and Blood Institute, \$509,660. (PI: Angelo Alonzo, Yale University)
98. 2006-2007: National Science Foundation IUCRC Planning Grant, \$10,000. (PI: Jay Ramanathan).
99. 2006-2007: IBM Faculty Award. \$40,000. (Co-PI Jay Ramanathan)
100. 2006-2007: Enterprise Architecture Research, NSF IUCRC-supported project, Nationwide Insurance, \$45,000. (Co-PI Jay Ramanathan)
101. 2006-2007: McGraw-Hill Education, Enterprise Architecture Pattern Mining, \$12,517. (PI: Jay Ramanathan)
102. 2006-2007: Enterprise Software Engineering and J2EE Workshops, Nationwide Insurance \$34,350. Program development, curriculum development, instruction and coordination. (Collaborators: Alan Cline, Robert Mathis, Paul Sivilotti, and John Thomas. Coordination through Fisher College of Business, Department of Executive Education.)
103. 2006-2007: City of Columbus, Department of Technology, DOJ-311 Evaluation, \$29,877. Role PI (Co-PI Jay Ramanathan, Anand Desai).
104. 2005-2006: City of Columbus, Department of Technology, 311 Architecture Validation, \$87,000. (Co-PI Jay Ramanathan)
105. 2005-2006: Motorola Gift. \$10,000.
106. 2003-2005: Project management services for Defense Advanced Research Projects Agency (DARPA), Network Embedded Systems Technology, \$81,000. (PI Anish Arora).
107. 2004-2005: Ohio Aerospace Institute, Data compression, formatting, and management of real-time meteorological data. \$51,711. (PI Hakan Ferhatosmanoglu)
108. 2003-2004: City of Columbus, Department of Technology, Information Technology Strategic Plan. \$19,600.
109. 2003-2004: Central Ohio Transit Authority, Services Architecture Validation. \$10,952.
110. 2002-2003: Migration Technologies, Legacy to three-tier migration. \$8500.

#### **University, College and Departmental Committee Memberships:**

- 2024: Computer Science and Engineering: Graduate admissions, finance, faculty search, outreach and engagement committees; College of Engineering: Promotion and Tenure, Research Strategy Committee, University: Sustainability Institute Strategic Advisory Committee.
- 2023: Computer Science and Engineering: Graduate admissions, faculty search, outreach and engagement committees; College of Engineering: Promotion and Tenure, Research Strategy Committee.
- 2022: Computer Science and Engineering: Graduate admissions, faculty search, outreach and engagement committees; College of Engineering: Promotion and Tenure, Research Strategy Committee.
- 2021: Graduate admissions, outreach and engagement committees, College Promotion and Tenure, Research Strategy Committee.
- 2020: Graduate admissions, outreach and engagement committees, College Promotion and Tenure, Research Strategy Committee.
- 2019: Graduate studies, graduate admissions, outreach and engagement committees, College Promotion and Tenure, Research Strategy Committee.
- 2018: Computer Science and Engineering Chair Search Committee, Graduate Studies, Graduate Admissions.
- 2010-2012: Computer Science and Engineering representative on the University Senate and Faculty Council, Council for Academic Freedom.
- 2011-2014: Member of the University Research Council.

- 2002-2011: Member Computer Science and Engineering Curriculum Committee, Undergraduate Studies Committee.
- 2005: Director Search Committee, Ohio State University Digital Union.

**Service to Computer Science and Engineering, Editorial and other Boards, Program Committee, Panel and Reviewer Activities:**

- Reviewer, ACM Transactions on Computing Education, 2024.
- Reviewer, ACM Transactions on Intelligent Vehicles, 2024.
- NSF Review Panelist CSSI Program, 2024.
- NSF Review Panelist CAREER Program, 2023.
- NSF Review Panelist POSE Program, 2023.
- Reviewer, IEEE Transactions on Neural Networks and Learning Systems, 2023.
- NSF Review Panelist, NRT Program 2022.
- NSF Review Panelist ENGINES Program, 2022.
- NSF Review Panelist POSE Program, 2022.
- NSF Review Panelist Convergence Accelerator Program, 2022.
- NSF Site Reviewer Engineering Research Centers Program, 2022.
- Program Committee Member, TheWebConf (formerly the World-Wide Web Conference) 2022.
- NSF Reviewer NSF/OAC programs, 2020.
- NSF Review Panelist joint NSF/MPS and NASA program, 2020.
- NSF Review Panelist OAC Core program, 2020.
- NSF Review Panelist Quantum Leap program, 2020.
- NSF Review Panelist OAC Core program, 2020.
- NSF Site Reviewer Engineering Research Centers Program, 2020.
- NSF Review Panelist OAC programs, 2019.
- NSF Review Panelist Quantum Leap program, 2019.
- NSF Site Reviewer Engineering Research Centers Program, 2019.
- Reviewer, IEEE Computing in Science and Engineering, 2018.
- Co-chair, The Networking and Information Technology Research and Development (NITRD) Program, coordination area on Middleware And Grid Interagency Coordination (MAGIC, [https://www.nitrd.gov/nitrdgroups/index.php?title=Middleware\\_And\\_Grid\\_Interagency\\_Coordination\\_\(MAGIC\)](https://www.nitrd.gov/nitrdgroups/index.php?title=Middleware_And_Grid_Interagency_Coordination_(MAGIC))), 2016-2017.
- Reviewer, Database Management & Information Retrieval, 2017.
- Reviewer, Journal of Systems and Software, 2017.
- Reviewer, 30th IEEE International Parallel & Distributed Processing Symposium, 2016.
- Editorial Board Member and Associate Editor Professional Practice (<http://www.computer.org/web/computingnow/software/edboard>), IEEE Software, 2015-current.
- Reviewer, ICTIEE-2015, Second International Conference on Transformations in Engineering Education, 2015.
- Proposal review panelist, NSF Cyberlearning Program, Information & Intelligent Systems Division (IIS), 2014.
- Reviewer, 47<sup>th</sup> Hawaiian International Conference on System Sciences (HICSS), 2013.
- Reviewer, Society of Computer Science in India (CSI) Transactions on ICT, 2013.
- Co-Chair, Cloud Computing Track, ACM Symposium for Applied Computing (SAC) 2014.
- Reviewer, Frontiers In Education (FIE) Conference, 2013.



- Reviewer, Future Generation Computer Systems (FGCS), Elsevier Publications, 2013.
- Reviewer, ACM Transactions on Speech and Language Processing, 2013.
- Co-Chair, Cloud Computing Track, ACM Symposium for Applied Computing (SAC) 2013.
- Program Committee Member, Enterprise Engineering Track, ACM Symposium for Applied Computing (SAC) 2013.
- Reviewer, Future Generation Computer Systems (FGCS), Elsevier Publications, 2012.
- Reviewer, Frontiers In Education (FIE) Conference, 2012.
- Reviewer, Journal of Data Mining and Knowledge Discovery (DAMI), 2012
- Co-Chair, Cloud Computing Track, ACM Symposium for Applied Computing (SAC) 2012.
- Program Committee Member, Enterprise Engineering Track, ACM Symposium for Applied Computing (SAC) 2012.
- Reviewer, Frontiers In Education (FIE) Conference, 2011.
- Reviewer, Transactions in Knowledge and Data Engineering (TKDE), 2011.
- Co-Chair, Cloud Computing Track, ACM Symposium for Applied Computing (SAC) 2011.
- Program Committee Member, Enterprise Engineering Track, ACM Symposium for Applied Computing (SAC) 2011.
- Panelist, FIE 2010 Workshop on Integrated Models of Entrepreneurship Education, Frontiers in Education Conference, Washington, D.C., October 2010.
- Reviewer, ACM/IEEE International Conference on Information Processing in Sensor Networks, 2010.
- Reviewer, IEEE Transactions on Parallel and Distributed Systems, 2010.
- Co-Chair, WETICE '09 International Workshop on Integrating the Edge with the Enterprise for Planning and Management, 18th IEEE International Workshops on Enabling Technologies: Infrastructures for Collaborative Enterprises, Groningen (The Netherlands), June 29 - July 1, 2009.
- Reviewer, IEEE 3rd International Workshop on Web and Pervasive Security, 2009.
- Reviewer, Springer Journal of Telecommunication Systems, Special Issue on Security for Multimedia and Ubiquitous Applications, 2009.
- Chair, Autonomic and Cloud Computing Track, Symposium for Applied Computing (SAC) 2008, March 2009.
- Reviewer, 42<sup>nd</sup> Hawaiian International Conference on System Sciences (HICSS), 2008.
- Reviewer, MODUS Workshop, IPSN 08, International Conference on Information Processing in Sensor Networks 2008, St. Louis, Missouri, USA, April 22-24, 2008.
- Program Committee Member, 3rd IEEE International Workshop on Security, Trust, and Privacy for Software Applications (STPSA 2008), COMPSAC 2008, July 2008.
- Program Committee Member, First International Workshop on Mobile Device and Urban Sensing (MODUS), April 2008.
- Co-Chair, Autonomic Computing Track, Symposium for Applied Computing (SAC) 2008, March 2008
- Session Chair, Middleware Engineering Track, Symposium for Applied Computing (SAC) 2008, March 2008
- Program Committee Member, Symposium for Applied Computing (SAC), Autonomic Computing Track, March 2007.
- Program Committee Member, 9th International Conference on Enterprise Information Systems (ICEIS'2007), 4th International Workshop on Ubiquitous Computing (IWUC'2007). <http://www.iceis.org/workshops/iwuc/iwuc2007-cfp.html>, 2007.

- Panelist, Panel on Global Software Development, IEEE Computer Society Signature Conference on Software Technology and Applications (COMPSAC), Chicago, Illinois, September 2006.
- Reviewer, International Journal of Distributed Sensor Networks, <http://www.tandf.co.uk/journals/titles/15501329.asp>, 2006-2007.
- Editorial Board Member, I/S: A Journal of Law and Policy for the Information Society, <http://www.is-journal.org>, 2004 – present.
- Reviewer, 26th Annual ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (PODC 2007), 2007.

#### **Workshops, Meetings, Panels and Invited Talks:**

- Keynote, “Better Together than Apart: Integrating Testbeds into a National CI Ecosystem for AI Research”, KNIT 7: A FABRIC Community Workshop, <https://fabric-testbed.net/events/knit-7>, September 2023.
- Poster, “Building an AI-Powered Assistant for Computational Scientists”, Vallabhajosyula, Swathi, Carstens, Bryan, Chen, Jian, Ramnath, Rajiv, OSU, Wolf, Matthew, ORNL. NSF CSSI Principal Investigators Meeting, Alexandria, Virginia 2022. <https://doi.org/10.5281/zenodo.6856744>.
- Panelist, SIAM CSE21 Minisymposium: Enhancing Sustainability and Productivity for Research, SIAM Conference on Computational Science and Engineering (CSE21), March 1-5, 2021 Software, [https://figshare.com/collections/SIAM\\_CSE21\\_Minisymposium\\_Enhancing\\_Sustainability\\_and\\_Productivity\\_for\\_Research\\_Software/5325824](https://figshare.com/collections/SIAM_CSE21_Minisymposium_Enhancing_Sustainability_and_Productivity_for_Research_Software/5325824)
- Software in the Era of Extreme Heterogeneity, Joint virtual workshop of High End Computing (HEC) and Software Productivity, Sustainability, and Quality (SPSQ) Interagency Working Groups, Invited participant, <https://www.nitrd.gov/nitrdgroups/index.php?title=Software-Extreme-Heterogeneity>, September 22 – 24, 2020.
- “Academia-Industry Collaborations: Research Outcomes, Lessons Learned and Opportunities”, invited talk, Department of Computer Science, University of Western Florida, 2019
- “Writing NSF proposals”, invited talk, Department of Computer Science, University of Western Florida, 2019
- “Ten Years of Academia-Industry Collaborations: Research Outcomes, Lessons Learned and Opportunities”, invited talk, Department of Electrical and Computer Engineering, University of Delaware, 2019.
- “The Evolving Role of NSF Software Programs and Software Gateways in a National Cyberinfrastructure Ecosystem”, keynote talk, Gateways 2016 Conference, San Diego, CA, November 2016, <https://www.youtube.com/watch?v=pEgR2hgJkp8>.
- “The Evolving Role of NSF Software Programs in a National Geospatial Cyberinfrastructure Ecosystem”, keynote talk, 2016 CyberGIS Workshop, Urbana-Champaign, IL, July 2016, [https://mediaspace.illinois.edu/media/t/1\\_tdkj1fpg/48747571](https://mediaspace.illinois.edu/media/t/1_tdkj1fpg/48747571).
- “The Evolving Role of NSF Software Programs and Campus Cyberinfrastructures in a National Cyberinfrastructure Ecosystem”, keynote talk, Advancing Research Computing on Campuses: Best Practices Workshop (ARC '16), National Center for Supercomputing Applications (NCSA), Illinois, March 2016.
- “The Role of Cyberinfrastructure” Case-Western Reserve University Cyberinfrastructure Days, March 15th, 2015, [https://www.youtube.com/watch?v=V\\_6Do94lhPI](https://www.youtube.com/watch?v=V_6Do94lhPI).

- “Virtual Academy: Creating a CS professional: Complementing the Classroom in Computer Science Education with Real-World Projects”, IUCEE Webinar, <http://youtu.be/qWNzOtNpJ7M>, May 2014.
- “Enhancing Computer Science Education with Real-World App Development Projects”, Invited Talk, Apple AcademiX 2011, <http://education.apple.com/academix/> and [http://education.apple.com/academix/videos/Rajiv\\_Ramnath.mov](http://education.apple.com/academix/videos/Rajiv_Ramnath.mov), May 2011.
- “Industry-Relevant Software Engineering”, Indo US Collaboration for Engineering Education (IUCEE) Workshop, Thiagarajar College of Engineering, Madurai, India, June 2010.
- “Complex Systems Integration”, Fisher College of Business Executive Education Workshop, Air Force Institute of Technology, Dayton, Ohio, USA, April 2010.
- “Building an Integrative Curriculum for Services Engineering through Industry-University Collaborations”, Invited Talk, Inaugural Symposium on Computer Science Education, Academic Panel, Franklin University, Columbus, Ohio, April 2009.
- “Technology Enablement of Virtual Manufacturing Cells in Job-shops,” Job-Shop Lean Conference, Columbus, Ohio, 2008.
- “IT-enabled Innovation,” Workshop for Nationwide Services Company, 2008
- “CETI Enterprise Architecture Forum: Impact of Mergers and Acquisitions on Enterprise Architecture,” Columbus, Ohio 2007
- “IT-enabled Innovation,” Qwest Billing Managers’ Retreat, Qwest Ltd., November 2007.
- “Developing the Next-Generation Workforce,” Ohio Digital Summit, Panel on Next-Generation Workforce, October 2007.
- “Employee Retention and Training” TechColumbus TechTalk, Panel on Employee Retention and Training, November 2006
- “How IT can Really Matter: Driving Innovation from Internal Information Technology Organizations,” Invited Talk, Central Ohio Chapter of the ACM, May 2006.
- TechColumbus TechTalk, Moderator, Panel on Six-Sigma, March 2006.
- “People, Process and Technology in Enterprise Architecture Integration,” TechColumbus TechTalk Panel on Enterprise Architecture Integration, October 2002.

#### Publicity:

- <https://engineering.osu.edu/news/2022/01/strengthening-ohios-broadband-and-5g-workforce>
- <https://news.osu.edu/ohio-state-interns-help-build-smart-columbus-operating-system/>
- <https://www.hpcwire.com/off-the-wire/nsf-awards-15m-create-science-gateways-community-institute/>
- [https://www.nsf.gov/news/news\\_summ.jsp?preview=y&cntn\\_id=189347](https://www.nsf.gov/news/news_summ.jsp?preview=y&cntn_id=189347)
- <http://insidehpc.com/2015/10/agave-platform-provides-science-as-a-service/>
- <http://circlcenter.org/meet-rajiv-ramnath/>
- <http://thelantern.com/2013/11/video-game-learning-research-program-granted-nearly-250k/>
- “A Springboard for Self-Starters”, International Innovation Magazine, North America, May, 2013.
- <http://www.seemoreinteractive.com/news/detail/1>
- <http://engineering.osu.edu/news/2012/08/students-win-stem-app-challenge-mobile-application-%E2%80%9Creal-ball%E2%80%9D>
- <http://digitalfirst.osu.edu/news/71>
- <http://www.usnews.com/education/blogs/college-cash-101/2008/11/17/is-a-college-degree-really-worth-the-cost>
- [http://www.bizjournals.com/columbus/stories/2008/03/24/daily30.html?jst=b\\_ln\\_hl](http://www.bizjournals.com/columbus/stories/2008/03/24/daily30.html?jst=b_ln_hl)

- <http://bostechcorp.absolutebica.com/?/news/details/the-ohio-state-university-leverages-bostech-chainbuilder-esb-open-source-so/>

**Awards:**

- (Lutron) Ruth and Joel Spira Award for Excellence in Teaching, 2022.
- Charles E. MacQuigg Teaching Award, College of Engineering, OSU, 2010.
- Department of Computer Science and Engineering Faculty Teaching Award 2007.

**Professional Organizations:**

- Member, Association of Computing Machinery (ACM) since 1989
- Member IEEE since 2014