Sajid Hussain, Ph.D.

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Current Position(s)

Professor, Computer Science & Data Science
School of Applied Computational Sciences (SACS)
Meharry Medical College

Education

Ph.D. Electrical Engineering, University of Manitoba, Winnipeg, Manitoba, Canada	2004	
M.S. Electrical Engineering, KFUPM, Dhahran, Saudia Arabia		1995
B.S. Electrical Engineering, University of Engineering & Technology, Lahore, Pakistan	1991	

Academic Appointments

Associate Provost Research	2023 – 2024
Director, Sponsored Research	2021 – 2024
Discipline Coordinator, Data Science	2019 - 2023
Director, Quality Enhancement Plan (QEP)	2019 – 2024
Associate Vice Provost for Innovation & IT	2018 - 2021
Associate Professor, Computer Science Fisk University Nashville, TN 37208	2009 - 2024
Assistant Professor Jodrey School of Computer Science Acadia University Wolfville, Nova Scotia, Canada	2005 – 2009
Instructor II	2004 – 2005
Instructor I Computer Science University of Manitoba Winnipeg, Manitoba, Canada	2000 - 2004

Certification and Licensure

N//a

Professional Memberships and Activities

IEEE
ACM

Committee Assignments and Administrative Services

Faculty Handbook Committee	2022 – 2025
Faculty Development Committee	2020 – 2022
Resources Learning Committee	2018 – 2020
Education & Research Committee	2010 – 2012
Secretary Faculty Assembly	2011 – 2012
Served on several University Committees and Hiring Committees	2009 - present

Educational Activities

Director of Center of Teaching and Learning, Fisk University 2019 - 2023
Organized faculty development workshops, organized Fall and Spring institutes, provided orientation sessions for new faculty members regarding Fisk education technology tools, conducted workshops on data analytics and quantitative skills.

New undergraduate Data Science, Fisk University 2019
Established an undergraduate Data Science program, offering B.A., B.S., and minor degrees.

New master's in data science, Fisk University 2022
Launched a master's program in Data Science, offering M.A. and M.S. degrees.

SACSCOC Accreditation – Standard 6.2a

Performed a leading role in preparing the Faculty Roster Form for SACSCOC Standard 6.2a, related to Faculty Qualification. Developed a Python-based software to automatically generate a faculty roster according to the SACSCOC template from a CSV file obtained from Fisk's ERP system (Ellucian). Served in Faculty Development Committee for several years. Also, served in Faculty Handbook Committee (2021 – 2024) and reviewed the sections related to faculty development, faculty incentives, faculty appointment as instructors and other related activities

Fisk University, Nashville, TN

CSCI 100 – Introduction to Computing (Python)	2009 – 2024
CSCI 110 – Introduction to Computer Science I	2009 – 2024
CSCI 390 – Machine Learning for Social Sciences	2018 - 2024
CSCI 120 – Object Orientation (Java)	2009 - 2021
CSCI 241 – Data Structures and Algorithms	2009 – 2021
CSCI 321 – Database Management	2009 – 2021
CSCI 360 – Computer Networks	2009 – 2021
CSCI 261 – Operating Systems	2009 – 2012
CSCI 291 – Programming Languages	2010 – 2012

Acadia University, Wolfville, Nova Scotia, Canada

Data Structures	2005 – 2009
Computer Architecture	2005 – 2009
Computer Networks	2005 – 2009
Wireless Sensor Networks (Graduate)	2005 – 2008

University of Manitoba, Winnipeg, Manitoba, Canada

Computer Usage	2000 – 2005
Java Programming I	2000 – 2005
Object Orientation	2000 – 2005
Database Design	2000 – 2005
Database Implementation	2000 – 2005
Software Engineering	2000 – 2005
Distributed Database Systems (Graduate)	2004 – 2005

Grants and Contract Awards

NSF INCLUDES (2214490), $998,289 (subaward **$1,177,313**), 2023-27, **Co-PI**, National Data Science Alliance, working with Talitha Washington (PI, Clark Atlanta University) and LaTanya Robertson (Howard University). Intellectual Merit: Train 20,000 black data scientists by working with 100 HBCUs and engage faculty and staff members using workshops, curriculum development workgroups, research affinity cohorts and committees such as Ethics & Bias, Faculty Development, Industry Partners. Fisk University is the lead hub for Southcentral Region (30 HBCUs) and we organize six (6) 2-day workshops in a year. Chair the working group of creating new majors (weekly meetings with the cohort to create new majors). Chair the “Ethics and Bias Committee” (six meetings in year) to prepare guidelines AI/ML with HBCUs perspective. Broader Impact: URM scientists for data science and emerging job markets.

NSF Implementation Award (181782), **$2,214,490**, 2018-25, **Co-PI**, Implementation Project: Achieving Greater Confidence and Competence in Quantitative and Computational Skills in STEM Disciplines at Fisk University, Intellectual Merit: Train STEM faculty for quantitative and computing skills. Organized Peer Mentoring support for students, faculty development sessions on quantitative and computing skills, collaborative interdisciplinary research. Broader Impact: URM faculty members are trained for necessary skills to develop workforce for STEM careers.

NSF IUSE (2235861), **$600,000**, 2023-26, **Co-PI**, “Development of Inclusive STEM Curriculum Using Data Science Innovations of W.E.B. Du Bois to Promote Diversity in Science.” Intellectual Merit: Include faculty and students from multiple institutions (UC Merced, Fisk University, and Princeton) and science disciplines to contribute to curriculum development and participate in testing its impact. The project intends to measure how the curriculum influences undergraduate student learning, sense of belonging in science, and persistence in science. Curricular materials and study results will be widely shared in an open, online repository, which could benefit large numbers of students and faculty in undergraduate science courses across the country. Scientific reasoning focuses across STEM courses based on data visualization techniques. Broader Impacts: URM scientists achievement impact on student success.

NSF GRANTED (2324459), **$100,000**, 2023-24, **Co-PI**, Conference: NSF GRANTED: A workshop series to establish the Middle-Tennessee Research Administration and Innovation Network (M-TRAIN), working with Joanne Spitz (PI, Vanderbilt) and Quincy Quick (TSU). Intellectual Merit: Establish a regional network for research administrators in middle Tennessee. Broader Impact: Collaboration of research administrators of middle TN.

Department of Energy (DE-EM0005266), **$1,282,049**, 2022-25, PI: Subaward, MSIPP Environmental Management Alliance, Savannah River National Laboratory. Intellectual Merit: Environmental Management research using polymers, sensors, cybersecurity, and AI/ML technology. Broader Impact: Training URMs for workforce development.

US Army (W911NF-23-1-0220), **$800,000**, 2023-27, **Co-PI**, New Generation Rare Earth Doped Low Phonon Crystals for Mid-IR Laser Applications. Intellectual Merit: Applying AI/ML techniques in the multi-layered architecture for efficient sensor applications. Broader Impact: Engaging URMs in emerging innovation sensors applications.

NSF (2346630), **$1,037,598**, 2024-26, **Co-PI**, CC* Regional Networking: Advancing Research and Education at small colleges in Rural and Metropolitan Alabama and Tennessee through IT Architecture Enhancements. Intellectual Merit: Georgia Tech in collaboration with Southern Light Rail and Southern Crossroads (SLR/SoX) provides advanced networking services for the research and education (R&E) communities across the Southeastern United States. This project extends advanced network services and provides cyberinfrastructure (Cl) access, training and support to researchers and educators from Jacksonville State University and four Minority Serving Institutions (MSIs): Tennessee State University, Fisk University, Meharry Medical College, and Alabama State University. Broader Impact: High bandwidth access to HBCUs in middle TN and Alabama.

NSF (2333737), $1,365,875 (subaward **$311,835**), 2023-28, Proto-OKN Theme 1 CollabNext: A PersonFocused Meta fabric for Open Knowledge Networks, working Lew Lefton (PI: Georgia Tech), Kinnis Gosha (Morehouse), and Lila Ghemri (Texas Southern University). Intellectual Merit: The knowledge graph, named CollabNext, utilizes open data sources and infrastructure and integrates AI and machine learning for data processing, while emphasizing human-in-the-loop input to ensure data accuracy and sustainability. The project involves a multi-university collaboration and draws upon computational thinking skills, data, and machine learning from various fields. Its focus is on democratizing data for broader societal benefit and the practical application of knowledge graphs. Collaborators range from academic institutions such as Fisk University and Morehouse College to industry and research partners like the Renaissance Computing Institute and TDP Data Systems. Broader Impact: CollabNext's effectiveness lies in its integration of diverse knowledge graph entities and its commitment to an inclusive and standardized data infrastructure. By prioritizing feedback from underrepresented researchers, the tool is poised to increase visibility for emerging research institutions, boost research collaborations, and foster a more diverse research workforce. Its comprehensive database will be fully integrated into the Open Knowledge Network, thus establishing a robust data infrastructure for other use cases.

NSF Target Infusion Project (TIP) (1332432), **$394,952**, 2013-17, **PI**, *Transforming Computer Science Education using 'upside down' Curriculum, Course-embedded projects, Integration with other STEM disciplines, and Peer Mentors.*

NSF Target Infusion Project (TIP) (1912588), **$281,056**, 2019-23, **Co-PI**, *Targeted Infusion Project: Infusing Machine Learning in Cognitive Psychology and Cognitive Bias Analysis: Enhancement of the Computer Science and Psychology Curricula*

NSF Workshop (2136382), **$99,926**, 2021-24, **Co-PI**, *Discovery Workshop on Enhancing Data Science Education by Leveraging Data Sets from the African Diaspora*

Publications (Selective)

Google Scholar: https://scholar.google.com/citations?user=tUasIbQAAAAJ

F. Kausar, R. Al-Hamouz and **S. Hussain**, "Energy Demand Forecasting for Electric Vehicles Using Blockchain-Based Federated Learning," in IEEE Access, vol. 12, pp. 41287-41298, 2024, doi: 10.1109/ACCESS.2024.3377661.IEEE Access 12, 41287-41298

Hendricks-Sturrup R, Simmons M, Anders S, Aneni K, Wright Clayton E, Coco J, Collins B, Heitman E, **Hussain S**, Joshi K, Lemieux J, Lovett Novak L, Rubin D, Shanker A, Washington T, Waters G, Webb Harris J, Yin R, Wagner T, Yin Z, Malin B, "Developing Ethics and Equity Principles, Terms, and Engagement Tools to Advance Health Equity and Researcher Diversity in AI and Machine Learning: Modified Delphi Approach", JMIR AI 2023;2:e52888, URL: https://ai.jmir.org/2023/1/e52888 DOI: 10.2196/52888

Malaika Simmons, Rachele Hendricks-Sturrup, Gabriella Waters, Laurie Novak, Martin Were, and **Sajid Hussain**, "An Expert Panel Discussion Embedding Ethics and Equity in Artificial Intelligence and Machine Learning Infrastructure", Published Online:27 September 2023, https://doi.org/10.1089/big.2023.29061.rtd

Leach, A.H., **Hussain, S**. (2021). Machine Learning for Understanding the Relationship Between Political Participation and Political Culture. Advances in Artificial Intelligence and Applied Cognitive Computing. Transactions on Computational Science and Computational Intelligence. Springer, Cham. https://doi.org/10.1007/978-3-030-70296-0_23

A. Leach and **S. Hussain**, "Black Political Participation in the Volunteer State," 2020 International Conference on Computational Science and Computational Intelligence (CSCI), Las Vegas, NV, USA, 2020, pp. 643-648, doi: 10.1109/CSCI51800.2020.00114.

Antwain Leach, **Sajid Hussain**, "Foreign Policy Attitudes of the Black Talented Tenth: Idealism Meets Reality" National Review of Black Politics (2020) 1 (2): 271–290. https://doi.org/10.1525/nrbp.2020.1.2.271

Hussain, S., Olayemi, A. & Yeo, SS. Genetic algorithm for effective open port selection for a web filter. Pers Ubiquit Comput 17, 1693–1698 (2013). https://doi.org/10.1007/s00779-012-0602-6

Sajid Hussain, Jong Hyuk Park, Anind K. Dey, Laurence T. Yang, Pratik K. Biswas, "Information fusion in future generation communication environments", Information Fusion, Volume 12, Issue 3, 2011, Pages 148-149, ISSN 1566-2535, https://doi.org/10.1016/j.inffus.2011.02.003.

Guo, W.; Xiong, N.; Chao, H.-C.; **Hussain, S**.; Chen, G. Design and Analysis of Self-Adapted Task Scheduling Strategies in Wireless Sensor Networks. Sensors 2011, 11, 6533-6554. https://doi.org/10.3390/s110706533

Andrei Gagarin, **Sajid Hussain**, Laurence T. Yang, "Distributed hierarchical search for balanced energy consumption routing spanning trees in wireless sensor networks", Journal of Parallel and Distributed Computing, Volume 70, Issue 9, 2010, Pages 975-982, ISSN 0743-7315, https://doi.org/10.1016/j.jpdc.2010.05.007.

S. Hussain, M. I. Shafique and L. T. Yang, "Constructing a CDS-Based Network Backbone for Energy Efficiency in Industrial Wireless Sensor Networks," 2010 IEEE 12th International Conference on High Performance Computing and Communications (HPCC), Melbourne, VIC, Australia, 2010, pp. 322-328, doi: 10.1109/HPCC.2010.96.