
MONIKA AKBAR

Assistant Professor, Department of Computer Science

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Research interests: Data and information systems (information integration and analytics), cyber-security, and Computer Science education.

EMPLOYMENT

2017 – Present	Assistant Professor, Department of Computer Science, University of Texas at El Paso, El Paso, TX.
2015 – 2020	Assistant Director, Cyber-ShARE Center of Excellence, University of Texas at El Paso, El Paso, TX.
2014 – 2017	Research Assistant Professor, Department of Computer Science and Cyber-ShARE Center of Excellence, University of Texas at El Paso (UTEP), El Paso, TX.
2006 – 2006	Lecturer, Dept of Information & Computer Tech., Metropolitan University, Bangladesh.

EDUCATION

- Virginia Tech. Blacksburg, Virginia, USA. Fall 2013
 - Ph.D. in Computer Science (CGPA: 4.00/4.00).
 - Montana State University - Bozeman. Bozeman, Montana, USA. Spring 2008
 - MS in Computer Science (CGPA: 3.96/4.00)
 - Shah Jalal University of Science and Technology. Sylhet, Bangladesh. 2005
 - B.Sc. (Engineering) in Computer Science and Engineering (CGPA: 3.86/4.00, with *Honours*).
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AWARDS AND HONORS

- Supervised research group that won the first place on Emerging Researchers National conference in STEM (ERN) video contest, 2017.
 - Mentored student who won the first place on the Undergraduate Poster session in ERN 2017.
 - Selected to participate in CRA-W Early Career Mentoring Workshop at SIGCSE 2017.
 - Secured Second place, Student Research Competition (SRC) – Graduate level at ACM SIGCSE 2012.
 - Selected to participate in the FORWARD to Professorship workshop in 2010.
 - Member of Upsilon Pi Epsilon (UPE) at Virginia Tech.
 - Virginia Tech AWC scholarship for participating in the Grace Hopper Conference in 2010.
 - Selected to participate in the 2007 CRA-W Grad Cohort Workshop, San Francisco, CA.
 - The B.Sc. (Engineering) degree was awarded with Honours.
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GRANT ACTIVITY

- Awarded
 - NSF STEM+C RPP: A Research-Practice Partnership for Developing Computational Thinking through Linguistically and Culturally Relevant CS Curriculum in Middle School. **Co-PI.**\$149,492

- NSF IUSE: Collaborative Research: Active Learning for Out-of-class Activities to Improve Student Success. **PI.** 2017. \$65,734
- Google CS4HS (Special Topics) grant to introduce computing concepts to middle and high school students. **PI.** 2018. \$32,500
- exploreCSR - Google Grant for a Pilot Program for Undergraduate Computer Science Research workshop led by Dr. Martine Ceberio. **Co-PI.** 2018. \$35,000
- NSF CREST Partnership supplement: Building capacity in information management through a partnership with Virginia Tech's Digital Library Technology Center. **Co-PI.** 2016. \$99,997
- Mike Loya Center for Innovation and Commerce funding for Border Health Information Exchange. **Co-PI.** 2018 \$35,000
- Undergrad Research Assistant through the On-Campus Student Employment Program, UTEP. **PI.** 2015. \$14,592
- Pending
 - NSF- Scholarship for Service Renewal: Advancing a Successful Cybersecurity Education and Workforce Development Program at UTEP. Co-PI. 2021-2026 \$4,049,354
 - NSF AI Institute: EquAL—An AI Institute to Drive Equity-Based, AI-Augmented Learning. Senior Personnel. \$20,000,000

TEACHING EXPERIENCE

- *Department of Computer Science, University of Texas at El Paso:* Instructor: CS 4390/5390: Information retrieval and Information Visualization, CS 4342 (Database Management), CS 1310 (Computational Thinking), CS 1320 (Introduction to Programming for Scientists and Engineers), and CS 1401 (Introduction to Computer Science).
- *Department of Information and Computer Technology, Metropolitan University, Bangladesh:* Lecturer. Computer Architecture, Algorithms, and Data Structures.

PUBLICATIONS

Book Chapter

1. **Monika Akbar**, Clifford A. Shaffer, Edward A. Fox. Social Networks in Digital Libraries, ed. by Edward A. Fox and Jonathan P. Leidig. Digital Library Applications: CBIR, Education, Social Networks, eScience/Simulation, and GIS. Morgan & Claypool Publishers, San Francisco, March 2014, 175 pages, ISBN paperback 9781627050326, ebook 9781627050333.
2. Edward A. Fox, **Monika Akbar**, Sherif Hanie El Meligy Abdelhamid, Noha Ibrahim Elsherbiny, Mohamed Magdy Gharib Farag, Fang Jin, Jonathan P. Leidig, Sai Tulasi Neppali. Digital Libraries. In Computing Handbook Vol. 2 (Information Systems and Information Technology), Section 3, Ch. 18, ed. by Heikki Topi, Chapman & Hall/CRC Press, Taylor and Francis Group, in press for 2014, <http://www.crcpress.com/product/isbn/9781439898444>.

Peer Reviewed Journal

3. M. A. Williams, R. C. Barranco, S. M. Naim, S. Dey, M. S. Hossain, and **Monika Akbar**. A Vulnerability Analysis and Prediction Framework. Computers & Security. February 2020, 101751, Elsevier, ScienceDirect. Impact factor: 3.062. <https://doi.org/10.1016/j.cose.2020.101751>
4. Acosta, J. C., Salamah, S., Padilla, E., **Akbar, M.**, Fielder, A. A Collaboration Pipeline for Cybersecurity Research, Analytics, and Tools. Cyber Security and Information Systems Information Analysis Center (CSIAC) journal, 2018 (<https://www.csiac.org/journal-article/a-collaboration-pipeline-for-cybersecurity-research-analytics-and-tools/>).

5. Juan Jose Rodriguez Vila, Nádia Puchalski Kozievitch, Tatiana M. C. Gadda, Keiko Fonseca, Marcelo O Rosa, Luiz C. Gomes-jr, **Monika Akbar**, “Urban Mobility Challenges – An Exploratory Analysis of Public Transportation Data in Curitiba”, in *Revista de Informática Aplicada*, Volume 12, number 1, 2016.
6. E. Fouh, **Monika Akbar**, and Clifford A. Shaffer, “The Role of Visualization in Computer Science Education”, *Computers in Education*, Volume 29, issue 1-2, 2012, pages: 95-117.
7. M. Shahriar Hossain, **Monika Akbar**, Nicholas F. Polys, “Narratives in the Network: Interactive Methods for Mining Cell Signaling Networks”, *Journal of Computational Biology*, Volume 19, issue 9, September 2012, pages: 1043-1059. Impact factor: 1.7.
8. Clifford A. Shaffer, Matthew L. Cooper, Alexander Joel D. Alon, **Monika Akbar**, Michael Stewart, Sean Ponce, Stephen H. Edwards, “Algorithm Visualization: The State of the Field”, in *ACM Transactions on Computing Education (TOCE)*, Volume 10, issue 3, 2010, pages: 9:1-9:22.

Peer Reviewed Conference and Workshop Publications

9. Roberto Camacho Barranco, Raimundo F. Dos Santos, M. Shahriar Hossain, **Monika Akbar**. Tracking the Evolution of Words with Time-reflective Text Representations. *IEEE Big Data*, Regular paper in the 4th Special Session on Intelligent Data Mining. The paper will appear at the *International Journal of Data Mining Science*, 2018.
10. Mark A. Williams, Sumi Dey, Roberto Camacho Barranco, Sheikh Motahar Naim, M. Shahriar Hossain, and **Monika Akbar**. Analyzing Evolving Trends of Vulnerabilities in National Vulnerability Database. *IEEE Big Data 2018*, International Workshop on Big Data Analytics for Cyber Intelligence and Defense. December 10-13, 2018, Seattle, WA, USA.
11. Muztaba Fuad, **Monika Akbar**, and Lynn Zubov. Dysgu: A Mobile-Based Adaptive System to Redesign Out-of-class Activities. In proceedings of the 48th Annual *Frontiers in Education (FIE)*, 2018, 1-5.
12. **Monika Akbar**, Lucia Dura, Ann Q. Gates, Angel Ortega, Mary K Roy, Claudia Santiago, Jesus G Tellez, Elsa Villa, Sol y Agua: A Game-based Learning Platform to Engage Middle-school Students in STEM. In proceedings of the 48th Annual *Frontiers in Education (FIE) Conference*, 2018, 1-9.
13. Francisco Osuna, **Monika Akbar**, Ann Q. Gates, On Using Disparate Scholarly Data to Identify Potential Members for Interdisciplinary Research Groups. *IEEE International Conference on Information Reuse and Integration (IRI)*, 59-68, 2017.
14. Prashant Chandrasekar, Islam Harb, **Monika Akbar**, Ann Gates, Chris Frank, Warren Bickel, Edward Fox and Elsa Tai. A DL framework and case studies with linked open data. *RUMOUR 2017*, a workshop held in conjunction with *ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL 2017)*, <http://2017.jcdl.org/>, Toronto, Canada, June 19-23, 2017.
15. Francisco Osuna, Bhanukiran Gurijala, Patricia Esparza, **Monika Akbar**, Ann Q. Gates, “A Feasibility Study of an Approach to Extend Research Footprints Using Disparate Sources”, in *AAAI workshop of Scholarly Big Data: AI Perspectives, Challenges, and Ideas*, 2016.
16. **Monika Akbar**, “Digital Technology Shaping Teaching Practices in Higher Education”, *Mini Review in Frontiers in ICT*, Volume: 3, 2016.
17. Nadia P. Kozievitch, Luiz C. Gomes-Jr, Tatiana M. C. Gadda, Keiko V. O. Fonseca, and **Monika Akbar**, “Analyzing the Acoustic Urban Environment - A Geofencing-Centered Approach in the Curitiba Metropolitan Region, Brazil”, in *Proceedings of the 5th International Conference on Smart Cities and Green ICT Systems (SmartGreens)*, Rome, Italy, April 23-25, 2016, 78-85.
18. Elsa Tai Wai Yan, Ann Q. Gates, **Monika Akbar**, “Cyber-infrastructure Support for the Integration and Analysis of Student Success Data”, in *Frontiers in Education (FIE)*, El Paso, Texas, USA, 2015, 1-5.

19. **Monika Akbar**, Clifford A. Shaffer, Weiguo Fan, Edward A. Fox, “Recommendation Based on Deduced Social Networks in an Educational Digital Library”, International Conference on Digital Libraries (DL 2014), London, Sept. 2014, 29-38. Long paper, acceptance rate < 25%.
20. Davinia Hernandez-Leo, **Monika Akbar**, Deborah Tatar, and Edward A. Fox. “Social tools for educators: supporting the needs of specific communities”. IEEE Learning Technology Newsletter special theme on “Social Networks and Social Computing in Technology-Enhanced Learning”, 2012 (<http://www.ieeetclt.org/issues/april2012/IEEE-LT-Apr2012.htm>).
21. **Monika Akbar**, Clifford A. Shaffer, Edward A. Fox, “Deduced Social Networks for an Educational Digital Library”, Proceedings of the 12th ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL 2012), Washington D.C., June 10-14, 2012, 43-46.
22. **Monika Akbar**, Weiguo Fan, Clifford A. Shaffer, Yinlin Chen, Lillian N. Cassel, Lois M. L. Delcambre, Daniel D. Garcia, Gregory W. Hislop, Frank M. Shipman III, Richard Furuta, B. Stephen Carpenter II, Hao-wei Hsieh, Bob Siegfried, Edward A. Fox. “Digital Library 2.0 for Educational Resources”. TPDL 2011:89-100. Acceptance rate = 19%.
23. Clifford A. Shaffer, **Monika Akbar**, Alexander Joel D. Alon, Michael Stewart, Stephen H. Edwards, “Getting Algorithm Visualizations into the Classroom”, Proceedings of the 42nd ACM technical symposium on Computer science education (SIGCSE), 2011, 129-134.
24. Edward A. Fox, Yinlin Chen, **Monika Akbar**, Clifford A. Shaffer, Stephen H. Edwards, Peter Brusilovsky, Dan Garcia, Lois Delcambre, Felicia Decker, David Archer, Richard Furuta, Frank Shipman, Stephen Carpenter, and Lillian (Boots) Cassel, “Ensemble PDP-8: Eight Principles for Distributed Portals”, Proceedings of ACM and IEEE Joint Conference on Digital Libraries (JCDL), 2010, 341-344. Acceptance rate = 25%.
25. M. Shahriar Hossain, **Monika Akbar** and Nicholas F. Polys, “Storytelling and Clustering for Cellular Signaling Pathways”, International Conference on Information and Knowledge Engineering (IKE'09), Las Vegas, Nevada, USA, Volume: 1, 2009, 109-115.
26. **Monika Akbar**, Rafal A. Angryk, “Frequent Pattern-Growth Approach for Document Organization”, ACM 17th Conference on Information and Knowledge Management (CIKM 2008), the 2nd International workshop on Ontologies and Information Systems for the Semantic Web, Napa Valley, California, October 26-30, 2008, 77-82.
27. M. Shahriar Hossain, **Monika Akbar** and Rafal A. Angryk, “Sense Based Organization of Descriptive Data”, 2007 IEEE International Conference on Systems, Man and Cybernetics, IEEE Press, Montreal, Quebec, Canada, October 7-10, 2007, 468-473.
28. M. Shahriar Hossain, **Monika Akbar** and J. Denbigh Starkey, “Inexpensive Construction of a 3D Face Model from Stereo Images”, 10th International Conference on Computer and Information Technology (IEEE Co-sponsored ICCIT '07), Dhaka, Bangladesh, December 27-29, 2007, 196-201.

Selected Peer-reviewed Abstracts

29. Muztaba Fuad, **Monika Akbar**, Lynn Zubov. Keeping Students Occupied with the Course Contents After Leaving the Classroom. ITiCSE 2020: 545-546
30. Muztaba Fuad, **Monika Akbar**, Lynn Zubov. Social Learning and Scaffolding to Improve Student's Self-efficacy and Engagement. SIGCSE 2020: 1288
31. Muztaba Fuad, **Monika Akbar**, and Lynn Zubov. “Active Learning for Out-of-Class Activities by Using Interactive Mobile Apps.” Sixth International Conference on Learning and Teaching in Computing and Engineering, April, 2018 Auckland, New Zeland, <http://par.nsf.gov/biblio/10057677>.

32. Ann Q. Gates, Mary Roy, **Monika Akbar**, Florencia Larsen, Ivonne Lopez, Christian Murga, Angel Ortega, Jesus Tellez, Rebecca Urbina, “The Sol y Agua Project: Enhancing Middle School Education through Computing with an Emphasis on Simulation and Data Science”, in SIGCSE, 2016, 699. doi: {10.1145/2839509.2850574}
33. Yanet Garay, **Monika Akbar**, Ann Q. Gates, “Towards Identifying Potential Research Collaborations from Scientific Research Networks Using Scholarly Data”, in the Proceedings of the 16th ACM/IEEE-CS on Joint Conference on Digital Libraries, 2016, 217-218. doi: {10.1145/2910896.2925439}
34. Ann Q. Gates, **Monika Akbar**, Mary K. Roy, Angel Ortega, Jesus Tellez, Ivonne López, Christian Murga, Kevin Lanahan, “Sol y Agua project: Promoting information science in middle school classrooms for a socially and environmentally responsible world”. RCIS, Grenoble, France, 2016: 1-2
35. **Monika Akbar**, Clifford A. Shaffer, “User Type Clustering to Refine Search and Browse for Educational Resources”, in Proceedings of the 43rd ACM Technical Symposium on Computer Science Education, 2012, 666. doi: {10.1145/2157136.2157371}
36. **Monika Akbar**, Weiguo Fan, Lillian Cassel, Lois Delcambre, Clifford A. Shaffer, and Edward A. Fox, “How Educators Find Educational Resources Online”, Conference on Innovation and Technology in Computer Science Education (ITiCSE), Germany, 2011, 367. doi: {10.1145/1999747.1999880}

Misc.

37. Jaime C. Acosta., **Monika Akbar**, Alex Fielder, “Comprehensive Data Analytics for Threat Detection,” Short paper in HICSS Symposium on Cybersecurity Big Data Analytics, 2017.

SYNERGISTIC ACTIVITIES

- Faculty advisor, UTEP chapter of Women in CyberSecurity (WiSys) - 2020.
- Program committee member – Joint Conference on Digital Libraries (JCDL) 2018, Information Reuse and Integration (IRI) 2018, Multimedia Information Processing and Retrieval (MIPR) 2018, 2019.
- Member, Poster Session Committee, Women in Cyber-Security Conference, Tucson, AZ, 2017.
- Judge, Emerging Researchers National Conference in STEM, Washington D.C., 2017.
- Topic Editor, Digital Education Data Analytics in Frontiers in ICT, <http://journal.frontiersin.org/researchtopic/5389/digital-education-data-analytics>
- Reviewer, National Science Foundation proposal, 2016.
- Associate Editor, Frontiers in ICT – Digital Education (http://www.frontiersin.org/Digital_Education).
- Reviewer of Transactions on Computing Education (TOCE), Complexity, Informatics and Cybernetics: IMCIC 2019, Springer Scientometrics, International Journal of Cooperative Information Systems (IJCIS), IEEE Transactions on Industrial Informatics, the International Conference on Progress in Informatics and Computing (PIC’14), and AAAI-15 Special Track on Computational Sustainability, International Conference on Bangla Speech and Language Processing (ICBSLP) 2018.
- Judge, Graduate student research Expo, University of Texas at El Paso, Fall 2016.
- Member of the Advancement of Women in Computing (AWiC) Committee at the Department of Computer Science at the University of Texas at El Paso.
- Member of the Fundamentals committee in the Department of Computer Science at UTEP.
- Member of Virginia Tech Association for Women in Computing (VT–AWC).
- Assisted designing and building Computer Science materials for outreach programs at Virginia Tech for COE STEP, NASA INSPIRE, C-Tech², and CEED Imagination groups in Summer 2011 (<http://www.computingportal.org/outreach>).
- Mentor for Montana Apprenticeship Program (MAP), Summer 2008.