

Deepti Joshi

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EDUCATION

Doctor of Philosophy , Computer Science University of Nebraska-Lincoln, Lincoln, Nebraska	MAY 2011
Master of Science in Applied Computer Science Northwest Missouri State University, Maryville, Missouri	MAY 2006
Master's Diploma in Computer Applications DOEACC Society, Government of India, New Delhi, India	DEC 2004
Bachelor of Arts in English (Honors) University of Delhi, Delhi, India	APR 2002
Diplome de Langue (French) Alliance Française de Delhi, Delhi, India	MAY 2002
Certificates	
Tackling the Challenges of Big Data , Massachusetts Institute of Technology	APR 2014
Online Teaching Faculty Academy , The Citadel	JUL 2013

APPOINTMENTS

Associate Professor Department of Cyber and Computer Sciences The Citadel (Military College of South Carolina), Charleston, SC	JAN 2018 – present
Associate Professor Department of Mathematics and Computer Science The Citadel (Military College of South Carolina), Charleston, SC	AUG 2017 – DEC 2018
Assistant Professor Department of Mathematics and Computer Science The Citadel (Military College of South Carolina), Charleston, SC	AUG 2011 – JUL 2017
Graduate Research Assistant Department of Computer Science and Engineering University of Nebraska-Lincoln, Lincoln, Nebraska	JUN 2007 – MAY 2011
Instructor Computer Science / Information Systems Department Northwest Missouri State University Maryville, Missouri	AUG 2006 – MAY 2007
Teaching Assistant Computer Science / Information Systems Department Northwest Missouri State University Maryville, Missouri	OCT 2004 – APR 2006

GRANTSMANSHIP

External

PI on National Geospatial-Intelligence Agency (NGA) Academic Research Program (NARP) – NURI grant, “Anticipating Social Unrest Using Web-Based Spatio-Temporal Data-Driven Techniques,” 07/10/2019 – 07/09/2024, **\$1,600,000**, contract number HM04761610002. In collaboration with UNL (PI: Leen-Kiat Soh, UNL)

Co-PI on NSF RPP grant. “”, 09/01/2019 – 08/31/2021, **\$290,000** (PI: Dr. Jennifer Albert, The Citadel).

Co-PI on NSF STEM+C grant. “Collaborative Research: DD: Integration is a Snap! Investigating a model for team-based, integrated professional development”, 09/01/2017 – 09/01/2010, **\$2,500,000** (PI: Dr. Jennifer Albert, The Citadel) in collaboration with North Carolina State University (PI: Tiffany Barnes, NC State).

PI on National Geospatial-Intelligence Agency (NGA) Academic Research Program (NARP) – NURI grant, “Anticipating Social Unrest Using Web-Based Spatio-Temporal Data-Driven Techniques,” 03/01/2016 – 03/01/2019, **\$283,263**, contract number HM04761610002. In collaboration with UNL (PI: Leen-Kiat Soh, UNL)

Director for Centers of Excellence Grant, Commission on Higher Education, South Carolina. STEM Ambassadors Program. 07/15/2013 – 08/31/2018, **\$634,500**.

Internal

Faculty Research Grant of \$3000, The Citadel Foundation, 2019-20.

Faculty Research Grant of \$3000, The Citadel Foundation, 2018-19.

Faculty Research Grant of \$3000, The Citadel Foundation, 2017-18.

Faculty Research Grant of \$3000, The Citadel Foundation, 2016-17.

Presentation Grant of \$431, The Citadel Foundation, November 2016.

Faculty Research Grant of \$3000, The Citadel Foundation, 2015-16.

Faculty Research Grant of \$2250, The Citadel Foundation, 2014-15.

Faculty Development Grant of \$1200, Dean’s Fund, The Citadel, 2014.

Faculty Research Grant of \$3000, The Citadel Foundation, 2013-14.

Faculty Development Grant of \$450, The Citadel Foundation, 2013.

Faculty Development Grant of \$1900, The Citadel Foundation, 2012.

Presentation Grant of \$900, The Citadel Foundation, October 2011.

RESEARCH

Research Interests

- a. **Spatio-temporal data mining and big data analytics.** Mining traditional and social media, including text, photos, and video for anticipatory analysis, strategic planning and operation.
- b. **Computer Science Education.** Developing a framework to address the question what does it mean to read and write code. Specifically, understanding CS literacy.
- c. **Cybersecurity Education.** Re-designing core CS curriculum to embed cybersecurity principles in all the courses. Specifically, developing a course mapping with security topics, and creating examples to be easily used with the existing curriculum.

Publications

Peer-Reviewed Conference Proceedings

- [1] Jocius, R., Joshi, D., Dong, Y., Catete, V., Dong, Y., Robinson, R., Barnes, T., Albert, J. & Lytle, N. (accepted, 2020). Code, connect, create: The 3C model for integrating computational thinking into content area classrooms, in *Proceedings of the 51st ACM Technical Symposium on Computer Science Education (SIGCSE '20)*, March 2020, Portland, Oregon USA.
- [2] Jocius, R., Albert, J., Andrews, A., Catete, V., Dong, Y., Joshi, D., Robinson, R., Barnes, T. & Lytle, N. (2019). Infusing Computing Through Professional Development: Shifts in Content Area Teachers' Understandings of Computational Thinking Integration. In K. Graziano (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 302-305). Las Vegas, NV, United States: Association for the Advancement of Computing in Education (AACE). Retrieved April 12, 2019 from <https://www.learntechlib.org/primary/p/207656/>.
- [3] Yihuan Dong**, Veronica Cateté, Robin Jocius, Nicholas Lytle**, Tiffany Barnes, Jennifer Albert, Deepti Joshi, Richard Robinson, Ashley Andrews. (2019) PRADA: A Practical Model for Integrating Computational Thinking in K-12 Education, in *Proceedings of the 50th ACM Technical Symposium on Computer Science Education (SIGCSE '19)*, February 2019, Minneapolis, Minnesota USA: Pages 906–912 <https://doi.org/10.1145/3287324.3287431>
- [4] Yihuan Dong, Veronica Cateté, Nicholas Lytle, Amy Isvik, Tiffany Barnes, Robin Jocius, Jennifer Albert, Deepti Joshi, Richard Robinson, and Ashley Andrews. 2019. Infusing Computing: Analyzing Teacher Programming Products in K-12 Computational Thinking Professional Development. In *Proceedings of the 2019 ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE '19)*. Association for Computing Machinery, New York, NY, USA, 278–284. DOI:<https://doi.org/10.1145/3304221.3319772>
- [5] Basnet, S.**, Soh, L. -K., Samal, A., & Joshi, D. (2018). Analysis of Multifactorial Social Unrest Events with Spatio-Temporal k-Dimensional Tree-based DBSCAN. Accepted for publication in *Proceedings of the 2nd ACM SIGSPATIAL Workshop on Analytics for Local Events and News (LENS'18)*. ACM, New York, NY, USA,
- [6] Albert, J., Jocius, R., Robinson, R., & Joshi, D. (2018). Lessons learned from PD on Problem-Solving and Sense-Making. In *Proceedings of the Interdisciplinary STEM Teaching & Learning Conference*, 17, Savannah, GA.
- [7] Joshi, D., Basnet, S., Arunachalam, H., Soh, L. -K., Samal, A., Ratcliff, S., & Werum, R. (2017). SURGE: Social Unrest Reconnaissance Gazetteer. In *Proceedings of the 25th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL'17)*. Redondo Beach, FL, USA, 4 pages. DOI: <https://doi.org/10.1145/3139958.3140052>
- [8] Albert, J., Jones, K., Joshi, D. & Jocius, R. (2016). What do Activity Trackers and a Tablet Have in Common? STEM Ambassador Lesson Plans, Tips, and Tricks. *SITE 2016*, Savannah, GA, USA.
- [9] Banik, S. & Joshi, D. (2015). Embedding Cybersecurity in Introduction to Programming I. *Information Systems Education Conference (ISECON 2015)*, Orlando, Florida, USA.
- [10] Ng, H.**, Joshi, D., & Banik, S. (2015). Applying Data Mining Techniques to Intrusion Detection. *12th International Conference on Information Technology: New Generations (ITNG 2015)*, Las Vegas, NV, USA.
- [11] Joshi, D., Samal, A., & Soh, L. -K. (2011). Extracting Information from Microblogs and Mobile Social Networks for Dynamic Decision Support. Position paper for The NSF CyberGIS Project All-Hands Meeting 2011. Oak Ridge, TN, USA.

- [12] Joshi, D., Samal, A., & Soh, L. -K. (2011). Treating Time as a First class Citizen. Association of American Geographers 2011 Annual Meeting, In Symposium on Space-Time Integration in Geography and GIScience, Seattle, USA.
- [13] Joshi, D., Samal, A., & Soh, L. -K. (2009). Density-Based Clustering of Polygons. *IEEE Symposium Series on Computational Intelligence and Data Mining*, (pp. 171-178). Nashville, TN.
- [14] Joshi, D., Samal, A., & Soh, L. -K. (2009). A Dissimilarity Function for Clustering Geospatial Polygons. *17th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS 2009)*, (pp. 384-387). Seattle, WA.
- [15] Joshi, D., Soh, L. -K., & Samal, A. (2009). Redistricting Using Heuristic-Based Polygonal Clustering. *IEEE International Conference on Data Mining*, (pp. 830-836). Miami, FL, USA.

** Graduate Student

Peer-Reviewed Journal Articles

- [1] Ballard, N.* & Joshi, D. (2019). Similarity Matching in News Articles, *Journal of Computing Sciences in Colleges*, Vol 35(4), pp. 46 – 51.
- [2] Clark, T.* & Joshi, D. (2019). Detecting Areas of Social Unrest through Natural Language Processing on Social Media, *Journal of Computing Sciences in Colleges*, Vol 35(4), pp. 68 – 73.
- [3] Beaput, A.* , Banik, S.M. & Joshi, D. (2019). Ranking Privacy of the Users in the Cyberspace, *Journal of Computing Sciences in Colleges*, Vol 35(4), pp. 109 – 114.
- [4] Verdicchio, M., Joshi, D. & Banik, S.M. (2016). Embedding Cybersecurity in the Second Programming Course (CS2), *Journal of Computing Sciences in Colleges*, Vol 32(2), pp. 165 – 171.
- [5] McCollum, N.* , Fayed, A.* , McIntosh, B.* , Carignan, J.* & Joshi, D. (2016). Using TWIG: India’s Past versus Present using Topic Modeling, *Journal of Computing Sciences in Colleges*, Vol 32(2), pp. 142 – 148.
- [6] Landry, C.* , Joshi, D. & Banik, S.M. (2016). Discovering User Information by Aggregating Social Media Data, *Journal of Computing Sciences in Colleges*, Vol 32(2), pp. 205-207
- [7] Dopson, B.* , Lowery, C.* & Joshi, D. (2014). Collecting and Analyzing Social Media Datasets, *Journal of Computing Sciences in Colleges*, Vol 30 (2), pp. 254-261
- [8] Joshi, D., Samal, A., & Soh, L. -K. (2014). A Dissimilarity Function for Polygons, *Knowledge and Information Systems*, Vol 41 (1), pp. 153-188
- [9] Joshi, D., Samal, A., & Soh, L. -K. (2013). Detecting Spatio-Temporal Polygonal Clusters Treating Space and Time as First Class Citizens, *GeoInformatica*, Vol 17 (2), pp. 387-412.
- [10] Joshi, D., Soh, L. -K. & Samal, A. (2012). Redistricting using Constrained Polygonal Clustering, *IEEE Transactions on Knowledge and Data Engineering*, Vol 24 (11), pp. 2065-2079.

* Undergraduate Students

Poster Presentation

- [1] Joshi, D., Samal, A., Soh, L. -K., Parrish, K*., Hotovy, J.* , Phon, P., & Manivannan, V** . (2011). Water Quest: A Volunteered Geographic Information System for Data collection and Synergistic Understanding of Water Resources, Human Activities, and Food Supply. Water for Food conference, Poster Competition, Lincoln, NE, USA.

Dissertation

- [1] Joshi, D. (2011). Polygonal Spatial Clustering. ETD collection for University of Nebraska - Lincoln. Paper AAI3449543. <http://digitalcommons.unl.edu/dissertations/AAI3449543>.

Invited Talks

- [1] Joshi, D. (2019). Understanding and Anticipating Unrest Events, University of Nebraska-Lincoln, Lincoln, Nebraska.
- [2] Joshi, D. (2019). Anticipating Social Unrest Using Data-Driven Techniques with emphasis on multi-agent simulation design framework, Intelligence Community Academic Research Symposium (ICARS 2019), Washington D.C.
- [3] Joshi, D. (2018). Anticipating Social Unrest Using Data-Driven Techniques with emphasis on multi-agent simulation design framework, Intelligence Community Academic Research Symposium (ICARS 2018), Washington D.C.
- [4] Joshi, D. (2017). Anticipating Social Unrest Using Data-Driven Techniques with emphasis on spatial-temporal unrest clustering, Intelligence Community Academic Research Symposium (ICARS 2017), Washington D.C.
- [5] Joshi, D. (2016). Anticipating Social Unrest Using Data-Driven Techniques, Intelligence Community Academic Research Symposium (ICARS 2016), Washington D.C.
- [6] Joshi, D. (2013), Spatio-Temporal Polygonal Clustering, SIGMA XI invited speaker, The Citadel, Charleston, SC.
- [7] Joshi, D. (2011), Polygonal Spatial Clustering. The Citadel, Charleston, SC.

AWARDS AND SCHOLARSHIPS

1. Faculty Award for Excellence in Research (2018), The Citadel
2. Graduate Research Assistantship (June 2007 – May 2011), Department of Computer Science and Engineering, University of Nebraska-Lincoln
3. Outstanding Graduate Student Award, Computer Science and Information Systems Department, Northwest Missouri State University
4. Graduate Assistantship (Jan 2005 – April 2006), Computer Science and Information Systems Department, Northwest Missouri State University

TEACHING

Courses Taught (Fall 2011 – Fall 2018)

COURSE NUMBER	COURSE TITLE	SEMESTERS OFFERED	PROGRAMMING LANGUAGE TAUGHT
UNDERGRADUATE COURSES			
CSCI 103	Survey of Computer Science	Fall – 2011	HTML/CSS
CSCI 110	Microcomputer Applications	Spring - 2012, 2013, 2014 Fall - 2012 (2)	Excel/Access
CSCI 201	Introduction to Computer Science I	Spring – 2012	Java
CSCI 202	Introduction to Computer Science II	Fall - 2011, 2013, 2014(2), 2015, 2016, 2017, 2018 Spring - 2016, 2017(2), 2018	Java
CSCI 205	Programming for Non-Majors	Spring – 2017, 2018	Python/ MIT App Inventor
CSCI 216	Introduction to Programming and Databases	Spring - 2012, 2013	Visual Basic (2012 – 2016)

		Fall - 2013, 2014, 2015, 2016, 2017, 2018	JavaScript (2017)
CSCI 217	Web Resources and Design	Spring - 2014, 2015, 2016	HTML/CSS/JavaScript/PHP
CSCI 320	Database Design	Fall - 2011, 2012 Spring - 2014, 2015, 2016, 2018	SQL
CSCI 399	Junior Research Project	Spring - 2016, 2018	Java, Python, NLP
CSCI 405	Operating Systems	Fall - 2014, 2016, 2018	C
CSCI 420	Software Engineering	Fall - 2012	Java
CSCI 490	CS Special Topics: Data Warehousing	Fall - 2015	SQL
CSCI 490	CS Special Topics: Data Mining	Fall 2017	Python (NLTK), SQL, Weka, RapidMiner
CSCI 499	Senior Research Project	Spring - 2014, 2016, 2017 Fall - 2016	Java, Python, NLP
GRADUATE COURSES			
CSCI 601	Data Modeling and Database Design	Spring - 2013, 2015	SQL
CSCI 603	Object-Oriented Design Patterns	Fall - 2013	-
CSCI 638	Advanced Topics in Database Systems	Summer- 2013, 2015	SQL and R
CSCI 663	Programming for STEM Educators [Online Only]	Summer -2014 Spring - 2017	Visual Basic / Python
CSCI 691	Independent Study	Summer - 2013 Fall - 2013	

Undergraduate/Graduate Student Research Advisees

1. Olivia Rentz, Undergraduate, 2020 –
2. Megan Gerlings Rascoe, Undergraduate, 2020 –
3. Ryan Skibicki, Undergraduate, 2020–
4. Eric Lilling, Undergraduate, 2020 –
5. Michael Dangerfield, Undergraduate, 2019 –
6. Maria Contreras, Undergraduate, 2019 –
7. Jared Johnson, Undergraduate, 2019 –
8. Shiloh Smiles, Undergraduate, 2019 –
9. Nathaniel Ballard**, Undergraduate, 2017 –
10. Michael A. Brister, Undergraduate, 2018 – 2019
11. Stone Ganley, Undergraduate, 2018 – 2019
12. Adrian Beauput, Undergraduate, 2018 – 2019
13. Timothy Clark, Undergraduate, 2018 – 2019
14. Maxwell Thompson**, Undergraduate, 2017 – 2019
15. Logan Roberts**, Undergraduate, 2017 – 2019
16. Joseph B Murphy, Undergraduate, 2016 – 2017
17. Tai Lum, Undergraduate, 2016 – 2017
18. Andrew Fayed[†], Undergraduate, 2016 – 17
19. James Carignan[†], Undergraduate, 2016 – 17
20. William J. McLagan, Undergraduate, 2016 – 17
21. Newton McCollum^{*†}, Undergraduate, 2014 – 16
22. Benjamin McIntosh^{*†}, Undergraduate, 2014 – 15
23. Peter Joseph^{*}, Undergraduate, 2014
24. Brian Dopson, Undergraduate, 2013 – 2014
25. Cardavian Lowery, Undergraduate, 2013 – 2014
26. Jonathon Ng, Graduate, 2013
27. Sherly R. Yesudhas, Graduate, 2013

**Received Second Award *under the SIGMA XI STEM Category at The Citadel Student Research Conference, 2018*. As a part of this project, the students expanded the news article scraping project to include additional

countries, namely, Pakistan, Bangladesh and India. A database spanning the years 2000 to 2017 was built. Next, natural language processing techniques were explored for geocoding news articles. Additionally, sentiment analysis was performed to discover the sentiments associated with different topics.

† Received *Third Award under the SIGMA XI STEM Category at The Citadel Student Research Conference, 2016.* As a part of this project, the students worked on writing code to scrape the newspaper websites and collect news articles which is not a trivial problem in itself. Next, they implemented a topic modeling algorithm, and applied it to the newspaper articles to discover trends of topic evolution over the years.

* Received *First Award under the SIGMA XI STEM Category at The Citadel Student Research Conference, 2015.* As a part of this project the students showed the proof of concept of developing a system called TWIG – The Web Information Gatherer, which on the backend has several different APIs implemented and collects public data from sites such as Twitter, Flickr and YouTube. The interface also allowed a user to then query the database for different search terms and retrieve the relevant information.

Pedagogical Activities

Teaching as part of CS Education and Related Grants. Over the past 5 and a half years, I have gained significant experience of working with and teaching middle and high school teachers various technologies and programming paradigms. I have conducted workshops on secure coding using Python, learning to program using Ozobots, App development using MIT App Inventor, and website designing using Google sites and basic HTML/CSS.

Currently as a Co-PI for the NSF STEM+C grant, I (along with a team of faculty members at The Citadel and NC-State) am working with a group of teachers from different content areas (Math, Science, ELA and Social Studies) from Laing Middle School, South Carolina to develop pilot lessons plans incorporating computing in their existing lesson plans. The programming language used will primarily be Snap, but also be extended to include MIT App Inventor and Scratch. The lessons plans developed will be rolled out in the summer over 2 weeks where 120 teachers will be trained.

In addition, we have also applied and received the partnership from code.org as professional learning partners to offer professional development opportunities for the middle and high school teachers in the low country area so that they are able to offer AP Computer Science and AP Computer Science Principles course at their schools.

Cybersecurity Education. I am working with Dr. Shankar Banik (The Citadel) to revise our CS curriculum to embed cybersecurity principles and concepts in all our CS courses required for the major.

SERVICE

University Services

- a. Served on the following School Wide Committees
 - Online Education task-force (Fall 2017 – current)
 - Financial Affairs Committee (2011 – current)
 - Undergraduate Curriculum Committee (2011 – 2016)
- b. Reviewed 200 papers for SACS summer ethical reasoning assessment
- c. Thesis mentor for high school student (Ms. Robyn Loucks) at Academic Magnet (2014-15)
- d. **Co-program manager**, Code.org Learning Partnership program. Under this, I will be working with Dr. Jennifer Albert of STEM Center, and Dr. Banik of MACS to provide professional development of AP Computer Science course from Code.org to high school teachers from South Carolina.

Departmental Services

- a. ACM Student Chapter – Co-Advisor
- b. Served on the following Departmental Committees:
 - 1) Undergraduate CS Curriculum Committee

- 2) Faculty Hiring Committees
 - a) Math – 2012-13 [Hired two Math faculty through this search]
 - b) CS –2016-17 [Hired one CS faculty through this search]
- 3) Math and CS Awards Committee (Chair 2014 - 17) – I was instrumental in the creation of outstanding freshman, sophomore, and junior awards. I also lead the awards ceremony each year since 2013.
- 4) Graduate CS Curriculum Committee
- 5) BS CS Assessment Committee
- 6) MACS CURE (Citadel Undergraduate Research Experience) Committee
- e. Assisted in the development of the materials for receiving Center of Academic Excellence for Cybersecurity designation form NSA/DHS.
- f. Assisted in the development of the materials for ABET re-accreditation.
- g. Assisted in the designing of a new major – B.S. in Computer Information Systems.

Professional Services

Reviewer/Program Committee

- a. IEEE Transactions on Education
- b. ACM Journal of Experimental Algorithms
- c. The Professional Geographer
- d. International Journal of Geographical Information Science
- e. Computers Environment and Urban Systems
- f. SIGCSE workshop proposals – 2016, 2017
- g. Consortium for Computing Sciences in Colleges: South East conference 2016
- h. CCSC:SE Conference – Session presider - 2013

Workshops Conducted

- a. **Programming with Ozobots**
STEM Ambassador’s program, Fall 2017/Spring 2018, The Citadel
- b. **Sense-making with Big Data and Visualization**
Part of the ITQ grant, Fall 2017, The Citadel
- c. **Secure Coding**
CyberCitadel, Summer 2017, The Citadel
- d. **Microsoft Excel 101**
STEM Ambassador’s program, July 2016, The Citadel
- e. **Web Design**
STEM Ambassador’s program, June 2016, The Citadel
- f. **Android App Development**
STEM Ambassador’s program, May 2015, June 2016, The Citadel
- g. **Web App Development**
South Carolina Junior Science Academy (SCJAS) Fall 2014 Workshop, November 2014, The Citadel
- h. **Computational Thinking**
7th Annual Summer Institute, Beaufort County School District, August 5-7, 2014.
- i. **Google Site Development**
STEM Ambassador’s program, June 2014, The Citadel

PROFESSIONAL SOCIETY MEMBERSHIPS

- a. Association for Computing Machinery (ACM)
- b. Institute of Electrical and Electronics Engineers (IEEE)