Tanmay Bhowmik, Ph.D.

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CAREER HIGHLIGHTS	
	• NSF CAREER Award (2023-28)
	• 9+ years of experience as a tenure-track/tenured faculty member
	• 50 peer-reviewed publications in premier conferences and journals
	• Best research paper award in the leading conference in my research area
	• Teaching 11 graduate and undergraduate courses (including both theory and hands-on classes)
	• Graduating 3 PhD and 4 thesis-based MS students (overall mentoring 23 graduate and undergraduate students)
	• Contentiously improving teaching modules reflecting official evaluations
	• Receiving exceptional teaching evaluations (average 4.5 on a scale of 5.0)
	• Serving on multiple NSF review panels
	• Serving on over 18 conference program committees

RESEARCH INTERESTS		
	• Software Engineering	2009-Present
	• Creativity in Requirements Engineering	
	• Requirements Engineering and Software Security	
	• Requirements Engineering and Software Testing	
	• Empirical Software Engineering	
	• Use of Natural Language Processing (NLP), Machine Learning, and Large Language Models (LLMs) in Requirements Engineering	

EMPLOYMENT		
	Associate Professor (tenured)	Fall 2024-Present
	Department of Computer Science and Engineering	
	Mississippi State University, USA	
	Assistant Professor (tenure-track)	Fall 2016-Summer 2024
	Department of Computer Science and Engineering	
	Mississippi State University, USA	
	Assistant Professor of Computer Science (tenure-track)	Fall 2015-Summer 2016
	School of Computer Science and Information Systems	
	Northwest Missouri State University, USA	
	Postdoctoral Research Fellow	Summer 2015
	National Strategic Planning and Analysis Research Center (NSPARC)	
	Mississippi State University, USA	

EDUCATION		
	Mississippi State University, USA	
	Ph.D., Computer Science	May 2015
	Dissertation Title: Stakeholders' Social Interaction in Requirements Engineering of Open Source Software	
	Dissertation Director: Dr. Nan Niu	

GPA: 4.0 out of 4.0

M.S., Computer Science   2010
GPA: 4.0 out of 4.0

National Institute of Technology, Durgapur, India   2007
B.Tech., Computer Science and Engineering
GPA: 8.05 out of 10.00 (*First Class with Distinction*)

AWARDS AND HONORS		
	1. The United States National Science Foundation (NSF) Faculty Early Career Development Program (CAREER) Award	2023-28
	2. Best Research Paper Award at the 29th IEEE International Requirements Engineering Conference	2021
	3. Best Reviewer Award at the 25th IEEE International Conference on Information Reuse and Integration for Data Science	2024
	4. Outstanding Service Award at the 23rd IEEE International Conference on Information Reuse and Integration for Data Science	2022
	5. Best Reviewer Award at the 22nd IEEE International Conference on Information Reuse and Integration for Data Science	2021
	6. Distinguished Graduate Scholar, Mississippi State University Bestowed upon only one graduate student in the college of engineering each Spring and Fall for excellence in research and publication	2015
	7. Teaching Assistant of the Year, Mississippi State University Bestowed upon one Ph.D. and one M.S. student in the university each year for excellence in teaching as instructor-of-record	2015
	8. Spirit of State, Mississippi State University Bestowed upon students who demonstrate an exceptional personal commitment to enhancing Mississippi State University campus life	2015
	9. Graduate Student Publication Award, Mississippi State University	2015
	10. Information Assurance Certificate, Mississippi State University	2015
	11. Graduate Student Publication Award, Mississippi State University	2013
	12. Best Research Presentation, Empirical Software Engineering Research Group, Mississippi State University	2012
	13. Graduate Student of the Month, Dept. of CSE Mississippi State University	April 2010
	14. Selected to Phi Kappa Phi Honor Society (bestowed upon students with 4.0 GPA) Mississippi State University	2009
	15. Full Scholarship for the Four-Year B.Tech. Program in CSE Government of India	2003-2007

PEER-REVIEWED PUBLICATIONS

Book Chapter

[B1] **Tanmay Bhowmik**, Vander Alves, and Nan Niu. "An Exploratory Case Study on Exploiting Aspect Orientation in Mobile Game Porting." In *Integration of Reusable Systems* (Thouraya Bouabana-Tebibel and Stuart H. Rubin eds.), Advances in Intelligent Systems and Computing, Volume: 263, Springer, 2014, pp. 241-261.

2014

Referred Journal Papers

[J12] *Kollin Napier*, **Tanmay Bhowmik**, and Zhiqian Chen. "Explaining Poor Performance of Text-Based Machine Learning Models for Vulnerability Detection." *Empirical Software Engineering.* 2024. (**Impact factor:** 3.762 as of 2021)

2024

[J11] *Kollin Napier*, **Tanmay Bhowmik**, and Shaowei Wang. "An Empirical Study of Text-based Machine Learning Models for Vulnerability Detection." *Empirical Software Engineering*. 2023. (**Impact factor:** 3.762 as of 2021)

2023

[J10] Zedong Peng, Prachi Rathod, Nan Niu, **Tanmay Bhowmik,** Hui Liu, Lin Shi. "Testing software's changing features with environment-driven abstraction identification." *Requirements Engineering (REJ)*, vol. 27, no. 4, 2022, pp. 405-427. (**Impact factor:** 2.882 as of 2021)

2022

[J9] *Anh Quoc Do,* **Tanmay Bhowmik,** and Gary L. Bradshaw. "Capturing Creative Requirements via Requirements Reuse: A Machine Learning-Based Approach." *Journal of Systems and Software (JSS)*, vol. 170, 2020. (**Impact factor:** 3.514 as of 2021)

2020

[J8] **Tanmay Bhowmik** and *Anh Quoc Do[1]*. "Refinement and Resolution of Just-in-Time Requirements in Open Source Software and a Closer Look into Non-Functional Requirements." *Journal of Industrial Information Integration*. 2018. (**Impact factor: 11.718** as of 2023)

2018

[J7] Sandeep Reddivari, **Tanmay Bhowmik**, and *Corey Hollis*. "Automated Support to Capture Verbal Just-in-Time Requirements via Audio Mining and Cluster-based Visualization," *Journal of Industrial Information Integration*. 2018. (**Impact factor: 11.718** as of 2023)

2018

[J6] Kazi Zakia Sultana, Byron Williams, and **Tanmay Bhowmik**. "A study examining relationships between micro patterns and security vulnerabilities." *Software Quality Journal*, 2017, pp. 5-41. (**Impact factor:** 2.132 as of 2021)

2017

[J5] **Tanmay Bhowmik**, Nan Niu, Prachi Singhania, and Wen Tao. "On the Role of Structural Holes in Requirements Identification: An Exploratory Study on Open Source Software Development." *ACM Transactions on Management Information Systems*, vol. 6, no. 3, 2015, Article No. 10.

2015

[J4] **Tanmay Bhowmik**, Nan Niu, Juha Savolainen, and Anas Mahmoud. "Leveraging Topic Modeling and Part-of-Speech Tagging to Support

2015

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[1] Author names in italic fonts in publication indicate my students.

Combinational Creativity in Requirements Engineering." *Requirements Engineering Journal (REJ)*, vol. 20, no, 3, 2015, pp. 253-280.

[J3] **Tanmay Bhowmik**, Nan Niu, Wentao Wang, Jing-Ru C Cheng, Ling Li, and Xiongfei Cao. "Optimal Group Size for Software Change Tasks: A Social Information Foraging Perspective." *IEEE Transactions on Cybernetics*, vol. PP, no. 99, 2015, pp. 1-12.   2015

[J2] Sandeep Reddivari, Shirin Rad, **Tanmay Bhowmik**, Nisreen Cain and Nan Niu. "Visual Requirements Analytics: A Framework and Case Study", *Requirements Engineering Journal (REJ)*, Volume: 19, Issue: 3, 2014, pp. 257-279.   2014

[J1] Harun Pirim, Dilip Gautam, **Tanmay Bhowmik**, Andy D. Perkins, Burak Eksioglu, and Ahmet Alkan. "Performance of an Ensemble Clustering Algorithm on Biological Data Sets." *Mathematical and Computational Applications*, Volume: 16, Issue: 1, 2011, pp. 87-96.   2011

PEER-REVIEWED PUBLICATIONS

Refereed Conference Papers

[C26] *Md Rayhan Amin*, *Daniel Tanner, Yashita Sharma,* Kollin Napier*,* and **Tanmay Bhowmik**. "Function-Level Software Metrics for Predicting Vulnerable Code." The 25th IEEE International Conference on Information Reuse and Integration for Data Science (IRI'24), San Jose, California, USA, 2024, pp. 152-257.   2024

[C25] **Tanmay Bhowmik**, *Anh Do*, *Hayden Lam*, *Md Rayhan Amin*, Gary Bradshaw, and Nan Niu. "On the Way to a Framework for Evaluating Creativity in Requirements Engineering." The 24th IEEE International Conference on Information Reuse and Integration for Data Science (IRI'23), Bellevue, Washington, USA, 2023, pp. 191-198.   2023

[C24] Aurek Chattopadhyay, Ganesh Malla, Nan Niu, **Tanmay Bhowmik**, and Juha Savolainen. "Completeness of Natural Language Requirements: A Comparative Study of User Stories and Feature Descriptions." The 24th IEEE International Conference on Information Reuse and Integration for Data Science (IRI'23), Bellevue, Washington, USA, 2023, pp. 52-57.   2023

[C23] Zedong Peng, Mahima Dahiya, Tessneem Khalil, Nan Niu, **Tanmay Bhowmik**, and Yilong Yang. "Resource-Centric Goal Model Slicing for Detecting Feature Interactions." The 24th IEEE International Conference on Information Reuse and Integration for Data Science (IRI'23), Bellevue, Washington, USA, 2023, pp. 58-63.   2023

[C22] Hemanth Gudaparthi, Nan Niu, Boyang Wang, **Tanmay Bhowmik**, Hui Liu, Jianzhang Zhang, Juha Savolainen, Glen Horton, Sean Crowe, Thomas Scherz, and Lisa Haitz. "Prompting Creative Requirements via Traceable and Adversarial Examples in Deep Learning." The 31st IEEE International Requirements Engineering Conference (RE'23), Hannover, Germany, 2023, pp. 134-145. **(Acceptance rate: ~24%)**   2023

[C21] *Kollin Napier* and **Tanmay Bhowmik**. "Text-Based Machine Learning Models for Cross-Domain Vulnerability Prediction: Why They may not be Effective?" The 23rd IEEE International Conference on Information Reuse and Integration for Data Science (IRI'22), Las Vegas, USA, Aug 8-10, 2022, pp. 158-163. 2022

[C20] *Md Rayhan Amin*, and **Tanmay Bhowmik**. "Information on Potential Vulnerabilities for New Requirements: Does It Help Writing Secure Code?" The 29th IEEE International Requirements Engineering Conference (RE'21), South Bend, USA, Sep 20-24, 2021, pp. 408-413. **(Acceptance rate: ~30%)** 2021

[C19] Zedong Peng, Prachi Rathod, Nan Niu, **Tanmay Bhowmik**, Hui Liu, Lin Shi, and Zhi Jin. "Environment-Driven Abstraction Identification for Requirements-Based Testing." The 29th IEEE International Requirements Engineering Conference (RE'21), South Bend, USA, Sep 20-24, 2021, pp.51-63. (**Best Paper Award)** 2021

[C18] **Tanmay Bhowmik**, *Austin Reid Thompson*, *Anh Quoc Do*, and Nan Niu. "Automated Support to Capture Environment Assertions for Requirements-Based Testing." The IEEE 22nd International Conference on Information Reuse and Integration for Data Science (IRI'21), Virtual Conference, USA, Aug 10-12, 2021, pp. 123-130. 2021

[C17] *Sayem Mohammad Imtiaz*, *Md Rayhan Amin*, *Anh Quoc Do*, Stefano Iannucci, and **Tanmay Bhowmik**. "Predicting Vulnerability for Requirements." The IEEE 22nd International Conference on Information Reuse and Integration for Data Science (IRI'21), Virtual Conference, USA, Aug 10-12, 2021, pp. 160-167. 2021

[C16] Mona Assarandarban, **Tanmay Bhowmik**, *Anh Quoc Do*, *Surendra Raju Chekuri*, Wentao Wang, and Nan Niu. "Foraging-Theoretic Tool Composition: An Empirical Study on Vulnerability Discovery." The IEEE 22nd International Conference on Information Reuse and Integration for Data Science (IRI'21), Virtual Conference, USA, Aug 10-12, 2021, pp. 139-146. 2021

[C15] *Sayem Mohammad Imtiaz,* Kazi Zakia Sultana, and **Tanmay Bhowmik**. "SecureChange: An Automated Framework to Guide Programmers in Fixing Vulnerability." The 32nd International Conference on Software Engineering and Knowledge Engineering (SEKE'20), Virtual Conference Center, USA, July 9-19, 2020, pp. 560-565. 2020

[C14] **Tanmay Bhowmik**, *Surendra Raju Chekuri*, *Anh Quoc Do*, Wentao Wang, and Nan Niu. "The Role of Environment Assertions in Requirements-Based Testing." The 27th IEEE International Requirements Engineering Conference (RE'19), Jeju Island, South Korea, Sep. 23-27, 2019, pp. 75-85. **(Acceptance rate: ~24%)** 2019

[C13] *Anh Quoc Do*, *Surendra Raju Chekuri*, and **Tanmay Bhowmik**. "Automated Support to Capture Creative Requirements via Requirements Reuse." The 18th International Conference on Software and Systems Reuse (ICSR'19), Cincinnati, OH, June 26-28, 2019, pp. 2019

47-63. An extension has been invited to the "Journal of Systems and Software".

[C12] *Sayem Mohammad Imtiaz* and **Tanmay Bhowmik.** "Towards Data-Driven Vulnerability Prediction for Requirements." The 26th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Lake Buena Vista, Florida, 2018, pp. 744-748. **(Acceptance rate: ~24%)**   2018

[C11] Sandeep Reddivari and **Tanmay Bhowmik**. "A Qualitative Investigation of Landmarks in Software Code Navigation." The 2nd ACM International Conference on Compute and Data Analysis (ICCDA), Illinois, USA, 2018, pp. 80-84.   2018

[C10] **Tanmay Bhowmik**. "Stakeholders' Social Interaction in Requirements Engineering of Open Source Software." Doctoral Symposium at the 22nd IEEE International Requirements Engineering Conference (RE'14), Karlskrona, Sweden, August 25, 2014, pp. 467-472.   2014

[C9] **Tanmay Bhowmik**, Nan Niu, Anas Mahmoud, and Juha Savolainen. "Automated Support for Combinational Creativity in Requirements Engineering." The 22nd IEEE International Requirements Engineering Conference (RE'14), Karlskrona, Sweden, August 25-29, 2014, pp. 243-252. **An extension has been invited to the "Requirements Engineering Journal" (cf. [J4]).** Acceptance rate: 27% (31 out of 115).   2014

[C8] Nan Niu, **Tanmay Bhowmik**, Hui Liu, and Zhendong Niu. "Traceability-Enabled Refactoring for Managing Just-In-Time Requirements." The 22nd IEEE International Requirements Engineering Conference (RE'14), Karlskrona, Sweden, August 25-29, 2014, pp. 133-142. Acceptance rate: 27% (31 out of 115).   2014

PEER-REVIEWED PUBLICATIONS   [C7] **Tanmay Bhowmik**, Nan Niu, and Donna Reese. "Students vs. Professionals in Assisted Requirements Tracing: How Could We Train Our Students?" The 121st ASEE Annual Conference and Exposition, Indianapolis, IN, USA, June 15-18, 2014.   2014

[C6] **Tanmay Bhowmik**, Vander Alves, and Nan Niu. "Porting Mobile Games in an Aspect-Oriented Way: An Industrial Case Study." The 14th IEEE International Conference on Information Reuse and Integration (IRI 2013), San Francisco, CA, USA, August 14-16, 2013, pp. 458-465. **Selected as a *best paper* and published in the book "Advances in Intelligent and Soft Computing" (cf. [B1]).** Acceptance rate: 26%.   2013

[C5] Nan Niu, Juha Savolainen, **Tanmay Bhowmik**, Anas Mahmoud, and Sandeep Reddivari. "A Framework for Examining Topical Locality in Object-Oriented Software." The 36th IEEE Computer Software and Applications Conference (COMPSAC 2012), Izmir, Turkey, July 2012, pp. 219-224. Acceptance rate: 30% (72 out of 237).   2012

[C4] Nan Niu, Vander Alves, and **Tanmay Bhowmik**. "Portability as an Aspect: Rethinking Modularity in Mobile Game Development." The   2011

10th International Conference on Aspect-Oriented Software Development (AOSD 2011), Porto de Galinhas, Pernambuco, Brazil, March 2011, pp. 3-4.

[C3] Harun Pirim, Dilip Gautam, **Tanmay Bhowmik**, Andy Perkins, and Burak Eksioglu. "Performance evaluation of a community structure finding algorithm using modularity and C-rand measures." The IEEE International Joint Conference on Neural Networks, Barcelona, Spain, July 2010, pp. 1-8.	2010
[C2] Harun Pirim, Dilip Gautam, **Tanmay Bhowmik**, Andy D. Perkins, Burak Eksioglu, and Ahmet Alkan. "Performance of an Ensemble Clustering Algorithm on Biological Data Sets." The International Symposium on Computing in Science and Engineering, Kusadasi, Turkey, June 2010, pp. 723-731.	2010
[C1] **Tanmay Bhowmik**, Nan Niu, and Edward Allen. "Modular Development and Verification of Domain Requirements via Model Checking." The 48th ACM Southeast Conference (ACMSE 2010), Oxford, Mississippi, USA, April 2010, Article No. 58.	2010

PEER-REVIEWED PUBLICATIONS

Refereed Workshop Papers

[W11] *Md Rayhan Amin*, **Tanmay Bhowmik**, Nan Niu, and Juha Savolainen. "Environmental Variations of Software Features: A Logical Test Cases' Perspective." The 31st IEEE International Requirements Engineering Conference Workshops (REW), Hannover, Germany, 2023.	2023
[W10] *Daniel Knight*, Stephen Torri, and **Tanmay Bhowmik**. "A Preliminary Critical Review of the Impact of Three Popular Development Practices on Source Code Maintainability." The 47th IEEE Computers, Software, and Applications Conference Workshops (COMPSACW), Torino, Italy, 2023.	2023
[W9] *Md Rayhan Amin* and **Tanmay Bhowmik**. "Existing Vulnerability Information in Security Requirements Elicitation." The 30th IEEE International Requirements Engineering Conference Workshops (REW), Melbourne, Victoria, Australia, 2022, pp. 220-225.	2022
[W8] *Austin Reid Thompson,* **Tanmay Bhowmik***,* and Nan Niu. "Environment Assertion Driven Requirements Elicitation: A Preliminary Study." The 30th IEEE International Requirements Engineering Conference Workshops (REW), Melbourne, Victoria, Australia, 2022, pp. 6-9.	2022
[W7] Sarah Sturmer, Nan Niu, **Tanmay Bhowmik**, Juha Savolainen. "Eliciting Environmental Opposites for Requirements-Based Testing." The 30th IEEE International Requirements Engineering Conference Workshops (REW), Melbourne, Victoria, Australia, 2022, pp. 10-13.	2022

[W6] *Andrea Montemaggio*, Stefano Iannucci, **Tanmay Bhowmik**, John Hamilton. "Designing a Methodological Framework for the Empirical Evaluation of Self-Protecting Systems." The IEEE International Conference on Autonomic Computing and Self-Organizing Systems - ACSOS 2020 Workshops, Virtual Conference, Washington DC, 2020.

2020

[W5] *Anh Quoc Do* and **Tanmay Bhowmik**. "Automated Generation of Creative Software Requirements: A Data-Driven Approach." The 26th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) Workshops, Lake Buena Vista, Florida, 2018, pp. 9-12.

2018

[W4] *Anh Quoc Do* and **Tanmay Bhowmik**. "Refinement and Resolution of Just-in-Time Requirements in Open Source Software: A Case Study." The 25th IEEE International Requirements Engineering Conference Workshops (REW), Lisbon, Portugal, 2017, pp. 407-410.

2017

[W3] *Corey Hollis* and **Tanmay Bhowmik**. "Automated Support to Capture Verbal Just-in-Time Requirements in Agile Development: A Practitioner View." The 25th IEEE International Requirements Engineering Conference Workshops (REW), Lisbon, Portugal, 2017, pp. 419-422.

2017

[W2] **Tanmay Bhowmik** and Sandeep Reddivari. "Resolution Trend of Just-in-Time Requirements in Open Source Software Development." The 1st International Workshop on Just-In-Time RE (JIT RE 2015), in affiliation with the 23rd IEEE International Requirements Engineering Conference (RE 2015), Ottawa, Canada, Aug 25, 2015, (in press).

2015

[W1] Nan Niu, Sandeep Reddivari, Anas Mahmoud, **Tanmay Bhowmik**, and Songhua Xu. "Automatic Labeling of Software Requirements Clusters." The 4th International Workshop on Search-Driven Development: Users, Infrastructure, Tools, and Evaluation (SUITE 2012), in affiliation with the 34rd International Conference on Software Engineering (ICSE 2012), Zurich, Switzerland, June 5, 2012, pp. 17-20. Acceptance rate: 20%.

2012

RESEARCH PROPOSAL WRITING AND GRANTS

19. Submitted: Nan Niu (PI), **Tanmay Bhowmik (PI),** and Hemanth Gudaparthi (PI), "Collaborative Research: CIRC: Planning-C: An Infrastructure and Dataset for Research in Continuous Requirements Engineering," U.S. National Science Foundation (NSF), $100,000; MSU Share: $32,999. (Credit on IAS: 100%)

2023

18. **Awarded: T. Bhowmik (PI), "CAREER:** Data-Driven Approach to Support Discovery of Creative Requirements," U.S. National Science Foundation (NSF), **$ 417,144**, **6/15/2023-5/31/2028, Award Number: 2236953**. (Credit on IAS: 100%)

2022

17. Submitted: **T. Bhowmik (PI)** and N. Niu (PI), "Collaborative Research: SHF: Small: Capturing Environmental Assumptions for Requirements-Based Testing," U.S. National Science Foundation (NSF), $599,993; MSU Share: $299,991. (Credit on IAS: 100%)

2022

16. Submitted: **T. Bhowmik (PI)** and N. Niu (PI), "Collaborative Research: SaTC: CORE: Small: Predicting Vulnerabilities for Software

2022

Requirements," U.S. National Science Foundation (NSF), $599,990; MSU Share: $299,990. (Credit on IAS: 100%)

	15. Submitted: **T. Bhowmik (PI)** and N. Niu (PI), "Collaborative Research: SHF: Small: Acceptance Testing of Continuously Developed Features with Varying Environments," U.S. National Science Foundation (NSF), $599,995; MSU Share: $299,996. (Credit on IAS: 100%, NSF Panel Recommendation: **Competitive**)	2022
	14. Submitted: **T. Bhowmik (PI)**, "A Prototype Solution to Predict Vulnerabilities for Software Requirements," U.S. Army Engineering Research and Development Center (ERDC), $100,000.	2021
	13. Submitted: **T. Bhowmik (PI)**, "A Data-Driven Framework to Predict Vulnerabilities for Software Requirements," Sony Research Award Program, $100,000.	2021
	12. Submitted: S. Wang (PI) and **T. Bhowmik (Co-PI)**, "SHF: Small: Enhance the Quality of API Code Examples on Knowledge Sharing Platforms for Effective Reuse," U.S. National Science Foundation (NSF), $499,999. (Credit on IAS: 40%)	2021
RESEARCH PROPOSAL WRITING AND GRANTS	11. **Awarded:** T. C. Falls (PI) and **T. Bhowmik** (Other Significant Personnel), "VePro-A: Vehicle Performance, Reliability & Operations - Analysis to Reduce Costs & Extend Life", U.S. Army Engineering Research and Development Center (ERDC), **$25,468.05.**	2020
	10. Invited: **T. Bhowmik (PI)**, "A Date-Driven Approach to Improve Software Security and Software Creativity," Microsoft Research, $200,000.	2019
	9. Submitted: S. Wang (PI) and **T. Bhowmik (Co-PI)**, "SHF: Small: Enhance the Quality of API Code Examples on Knowledge Sharing Platforms for Effective Reuse," U.S. National Science Foundation (NSF), $499,706. (Credit on IAS: 40%, NSF Panel Recommendation: **Low Competitive**)	2019
	8. Submitted: **T. Bhowmik (PI)**, "SaTC: Core: Small: Data-Driven Vulnerability Prediction for Software Requirements," U.S. National Science Foundation (NSF), $498,891. (Credit on IAS: 100%)	2019
	7. Submitted: **T. Bhowmik (PI)**, "**CAREER:** Data-Driven Approach to Automate Discovery of Creative Requirements," U.S. National Science Foundation (NSF), $537,566. (Credit on IAS: 100%, NSF Panel Recommendation: **Low Competitive**)	2019
	6. Submitted: **T. Bhowmik (PI)**, "**CAREER:** Data-Driven Approach to Automate Discovery of Creative Requirements," U.S. National Science Foundation (NSF), $566,915. (Credit on IAS: 100%, NSF Panel Recommendation: **Low Competitive**)	2018
RESEARCH PROPOSAL WRITING AND GRANTS	5. **Awarded: T. Bhowmik** (PI), "Towards Data-Driven Environment Assertions for Security Requirements", Office of Research and Economic Development (ORED) Undergraduate Research Program, Mississippi State University, **$4,000.**	2018-2020

4. Submitted: **T. Bhowmik (PI),** "SaTC: Core: Small: Towards Data-Driven Domain Analysis for Security Requirements," U.S. National Science Foundation (NSF), $499,955. (Credit on IAS: 100%) — 2017

3. Submitted: **T. Bhowmik (PI)**, "CRII: III: Leveraging Data Mining to Automate Discovery of Creative Requirements," U.S. National Science Foundation (NSF), $174,990. (Credit on IAS: 100%, NSF Panel Recommendation: **Low Competitive**) — 2017

2. **Awarded: T. Bhowmik** (PI) and Gary Bradshaw, "A Framework to Evaluate Creativity in Requirements Engineering", Cross-College Research Program, Office of Research and Economic Development, Mississippi State University, **$4,000.** — 2016-2018

1. Submitted: Two research proposals, one as the PI and one as a Co-PI, for the Theoretical and Applied Research Grant at Northwest Missouri State University (**Awarded one, $1,500**). — 2015-2016

TECHNICAL PRESENTATION

16. **Refereed: "**The Role of Environment Assertions in Requirements-Based Testing," the 27th IEEE International Requirements Engineering Conference (RE'19), Jeju Island, South Korea, 2019. — 2019

15. **Refereed: "**Automated Support to Capture Creative Requirements via Requirements Reuse," the 18th International Conference on Software and Systems Reuse (ICSR'19), Cincinnati, OH, 2019. — 2019

14. **Refereed:** "Towards Data-Driven Vulnerability Prediction for Requirements." The 26th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Lake Buena Vista, Florida, 2018. — 2018

13. **Refereed:** "Automated Generation of Creative Software Requirements: A Data-Driven Approach." In The 26th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) Workshops, Lake Buena Vista, Florida, 2018. — 2018

12. **Refereed:** "Refinement and Resolution of Just-in-Time Requirements in Open Source Software: A Case Study." In IEEE 25th International Requirements Engineering Conference Workshops (REW), Lisbon, Portugal, 2017. — 2017

11. **Refereed:** Automated Support to Capture Verbal Just-in-Time Requirements in Agile Development: A Practitioner View." In IEEE 25th International Requirements Engineering Conference Workshops (REW), Lisbon, Portugal, 2017. — 2017

10. **Invited:** "Stakeholders' Social Interaction in Requirements Engineering of Open Source Software," Department of Computer Science and Engineering, Mississippi State University, April 22, 2016. — 2016

9. **Invited:** "Stakeholders' Social Interaction in Requirements Engineering of Open Source Software," Computer Science Seminar, University of Texas at El Paso, January 19, 2016. — 2016

	8. **Invited:** "Stakeholders' Social Interaction in Requirements Engineering of Open Source Software," Department of Computer Science's Colloquium Series, University of Alabama February 3, 2015.	2015
	7. **Refereed:** "Stakeholders' Social Interaction in Requirements Engineering of Open Source Software," Doctoral Symposium at the 22nd IEEE International Requirements Engineering Conference (RE 2014), Karlskrona, Sweden, August 25, 2014.	2014
	6. **Refereed:** "Automated Support for Combinational Creativity in Requirements Engineering," 22nd IEEE International Requirements Engineering Conference (RE 2014), Karlskrona, Sweden, August 25-29, 2014.	2014
TECHNICAL PRESENTATION	5. **Refereed:** "Students vs. Professionals in Assisted Requirements Tracing: How Could We Train Our Students?" 121st ASEE Annual Conference and Exposition, Indianapolis, IN, USA, June 15-18, 2014.	2014
	4. **Invited:** "Creativity in Requirements Engineering," Research Presentation to the Advisory Board of the Department of Computer Science and Engineering, Mississippi State University.	2014
	3. **Refereed:** "Porting Mobile Games in an Aspect-Oriented Way: An Industrial Case Study," 14th IEEE International Conference on Information Reuse and Integration (IRI 2013), San Francisco, CA, USA, August 14-18, 2013.	2013
	2. **Refereed:** "Modular Development and Verification of Domain Requirements via Model Checking." 48th ACM Southeast Conference (ACMSE 2010), Oxford, Mississippi, USA, April 2010, Article No. 58.	2010
	1. **Volunteered:** Research Presentation in Every Semester, Empirical Software Engineering Research Group, Mississippi State University.	2009-Present

TRAINING ON TEACHING AND LEARNING	**Preparing Future Faculty Program** Graduate School and Center for Teaching and Leaning Mississippi State University	2012-2013
	● Successfully completed the year-long program followed by a three-credit hour course.	
	● From the whole university, about twenty Ph.D. students are selected for the program through a competitive selection process.	
	● Learned methods for teaching, learning, research, and service.	

TEACHING EXPERIENCE	**Assistant Professor** (tenure-track) Department of Computer Science and Engineering Mississippi State University, USA	Fall 2016-Present

Course	Semester	Class Size	Official Evaluation[2]
CSE 2813 Discrete Structures	Spring 2020	52	4.2
	Fall 2018	55	4.5

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[2] Official evaluation is available on request.

Course	Semester	Class Size	Official Evaluation
CSE 8283 Empirical Software Eng.	Fall 2019	16	4.6
	Fall 2018	6	4.9
CSE 8273 Software Reqs. Eng.	Spring 2024	18	4.9
	Spring 2023	14	4.9
	Spring 2021	14	4.5
	Spring 2018	16	4.6
CSE 4214/6214 Intro to SE	Spring 2022	37	4.1
	Fall 2021	55	4.5
	Fall 2020	50	4.4
	Fall 2017	30	4.5
	Spring 2017	35	4.4
	Fall 2016	27	4.5
CSE 4283/6283 SW Testing & QA	Spring 2024	49	4.9
	Spring 2023	47	4.4
	Spring 2022	37	4.9
	Spring 2020	45	4.3
	Spring 2019	30	4.3
CSE 4233/6233 SW Architecture	Fall 2023	55	4.9
	Fall 2022	45	4.9
	Fall 2021	39	4.6
	Fall 2020	47	4.2
	Fall 2019	45	4.6

Assistant Professor (tenure-track)
Department of Mathematics, Computer Science and Information Systems
Northwest Missouri State University, USA

Fall 2015-
Summer
2016

Course	Semester	Class Size	Official Evaluation[3]
CSIS 596 Grad Direct. Project I	Summer 2016 (2 sections)	29 each	--
CSIS 562 Software Eng. II	Spring 2016	18	--
CSIS 542 OOP in Java	Spring 2016	22	--
CSIS 563 Dev Web App & Serv	Spring 2016 (2 sections)	30 each	--
	Fall 2015 (3 sections)	40 each	--
CSIS 525 Th & Imp of Prog Lang	Fall 2015	47	--

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[3] Northwest Missouri State University did not release official evaluation during my tenure there.

Instructor-of-Record   2014-2015
Department of Computer Science and Engineering
Mississippi State University

Course	Semester	Class Size	Official Evaluation
CSE 2813 Discrete Structures	Spring 2015	54	4.7
	Fall 2014	31	4.8

Average official evaluation in this course for other instructors is 4.1

Responsibilities: Teaching the courses with 100% responsibility.

- Redesigned the course based on:
  - Training received during the "Preparing Future Faculty" program at Mississippi State University.
  - A combination of the teaching and learning principles explored by Ambrose et al. (2010), and by Newcomb and colleagues (2004).
  - The recommendations offered in "Educating the Engineer of 2020 – Adapting Engineering Education to the New Century", published by the National Academy of Engineering.
- A detailed Syllabus and Course Calendar is available on my website: http://web.cse.msstate.edu/~tbhowmik/teaching.htm

Teaching Assistant   2009-2010
Department of Computer Science and Engineering
Mississippi State University

Course	Semester	Class Size
CSE 6833 Intro to Algorithms	Fall 2010	28
	Fall 2009	26
CSE 2383 - Data Structure	Fall 2010	27
CSE 3813 Intro to Formal Lang & Automata	Fall 2009	29
	Spring 2009	33
CSE 6613 Intro to Biocomputing	Fall 2009	25
CSE 6733 Intro to Operating Systems	Spring 2009	28

Responsibilities: All duties of a regular Teaching Assistant.
- Taught class as a guest instructor.
- Collaborated on quiz and exam development with the instructor.
- Graded all written works, including final exam papers and assignments.
- Met students at a regular basis to help them with course works.

TEACHING INTERESTS
- Software Requirements Engineering
- Discrete Structures
- Empirical Software Engineering
- Software Testing and Quality Assurance

- Software Architecture
- Introduction to Software Engineering

RESEARCH EXPERIENCE	**Assistant Professor (tenure-track)** Department of Computer Science and Engineering Mississippi State University Activities:	2016-Present

- Conducting research on requirements engineering (RE) with three major themes: i) developing mechanisms to capture and evaluate creative software requirements, ii) examining the role of application environment assumptions in developers' testing activities, and iii) linking RE with Secure Software Engineering by focusing on predicting vulnerabilities for software requirements
- Writing proposals
- Guiding Ph.D. Dissertation and Master's Thesis

	Postdoctoral Research Fellow National Strategic Planning and Analysis Research Center (nSPARC) Mississippi State University Supervisors: Domenico Parisi and Drew Boyles Project: Connecting SNAP Participants to the Growing Demand for Middle-Skill Jobs. Activities:	Summer 2015

- Analyzing legacy systems with different government agencies and eliciting requirements for the new software system
- Developing software requirement specification for the new software system

RESEARCH EXPERIENCE	**Research Assistant** National Strategic Planning and Analysis Research Center (nSPARC) Mississippi State University Supervisors: Steven Grice and Martin Duclos Project: Statewide Longitudinal Data System (SLDS) Project[4] Activities:	2012-2014

- Collecting data relevant to education, workforce, and economic development in the state of Mississippi from different government agencies.
- Analyzing data and creating a reporting system to help answer critical policy questions in relevant areas.

RESEARCH EXPERIENCE	**Research Assistant** Department of Computer Science and Engineering Mississippi State University Supervisor: Nan Niu Project: US National Science Foundation (NSF), SHF: EAGER: "Clustering Programming Artifacts to Enrich Code Foraging Environment" (PI: Nan Niu)[5]	2011-2012

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[4] https://lifetracks.ms.gov/SitePages/Home.aspx
[5] http://www.nsf.gov/awardsearch/showAward?AWD_ID=1238336

Activities:
- Developing an experimental framework to assess topical locality in software.
- Looking at software maintenance from the perspective of information foraging, and creating new set of metrics to guide profitable code foraging.
- Comparing well-established source-code clustering algorithms to discover effective enrichment mechanisms for code foraging.

Project: US Department of Homeland Security (DHS), SERRI: Real-Time Identification and Monitoring of Barge-Carried Hazardous Commodities (PI: Mingzhou Jin, Co-PI: Nan Niu)
Activities:
- Collecting routing data for barge-carried hazardous commodities.
- Analyzing data to create a prediction module that facilitates real-time identification and monitoring of such commodities.
- Creating a software system that implements the prediction module and provides such identification and monitoring facilities.

RESEARCH EXPERIENCE	**Research Assistant** Department of Computer Science and Engineering Mississippi State University Supervisor: Andy Perkins Project: Improved Computational Tools for Next-Generation Sequence Data Processing and Analysis Activities:	2010

- Developing algorithms and techniques to improve DNA sequence data processing.
- Integrating those algorithms, techniques, and existing tools to facilitate DNA sequence data processing and analysis in an improved manner.

GRADUATE STUDENT ADVISING	**Current Ph.D. Students**	2024

4. Md Rayhan Amin
3. Daniel Knight
2. Quoc Bui
1. Tahsin Tasnia

	Current MS (thesis) Students	2024

1. Yashita Sharma

	Current MS (non-thesis) Students	2024

2. Tony Ruiz
1. Jahrell Harris

GRADUATE STUDENT ADVISING	**Graduated Ph.D. Students**	

3. Kollin R. Napier
   Dissertation Title: An analysis of text-based machine learning models for vulnerability detection

2023

Graduation Semester: Spring 2023

2. Oluwatobi Lassissi (co-advised with Dr. Cindy Bethel) Dissertation Title: Beyond algorithms: A user-centered evaluation of a feature recommender system in requirements engineering Graduation Semester: Spring 2023	2023
1. Quoc Anh Do Dissertation Title: Towards Generation of Creative Software Requirements Graduation Semester: Spring 2020	2020

Graduated MS (thesis) Students

4. Joshua Church Thesis Title: Step Toward Understanding Software Development in the Public Sector: A Study of a Department of Defense Research and Development Organization Graduation Semester: Spring 2023	2023
3. Austin Reid Thompson Thesis Title: On the role of environment assertions in requirements engineering and testing Graduation Semester: Spring 2021	2021
2. Surendra Raju Chekuri Thesis Title: On the role of environment assertions in requirements engineering and testing Graduation Semester: Summer 2019	2019
1. Sayem Md Imtiaz Thesis Title: Predicting vulnerability for requirements: A data-driven approach Graduation Semester: Summer 2019	2019

Graduated MS (non-thesis) Students

9. Krunal Patel	As of Fall
8. Dustin Brown	2023
7. Yang Yun	
6. Christopher Diaz	
5. Hayden Lam	
4. Steaven Nunnely	
3. Tyler Narmore	
2. Justin Wagner	
1. Kortni Dees Neil	

SERVICE ACTIVITIES

Departmental Service

7. **Selected Committee Member:** Departmental BPC Committee, Dept. of Computer Science and Engineering	2023-Present

6. **Selected Committee Member:** The Graduate Admissions Committee, Dept. of Computer Science and Engineering		2016-Present
5. **Selected Committee Member:** Faculty Search Committee, Dept. of Computer Science and Engineering, 2018		2023, '20, '19, '18
4. **Selected Coordinator:** CSE Seminar Series at Mississippi State University, 2021-22 academic year		2021-2022
3. **Volunteered Representative of the Department:** CSE in the BCoE E-day for High School students		2020
2. **Volunteered Committee Member:** Publicity and Recruitment Committee of Computer Science and Information Systems, Northwest Missouri State University		2015
1. **Volunteered Committee Member:** Curriculum Committee of M.S. in Applied Computer Science, Northwest Missouri State University		2015

College Service

1. **Selected Committee Member:** MSU BCoE Diversity, Equity, and Inclusion (DEI) Working Group o Attend the working group meeting each month and contribute to the DEI related strategy development for the College		2021-Present

SERVICE ACTIVITIES

University Service

6. **Invited Speaker:** Summer Coding Camp, Mississippi State University, 2021 • I was invited by the coding camp organizer Ms. Shally Hollis. I delivered a one-hour talk on computer science and software engineering.		2021
5. **Volunteered Judge:** MSU 2019 Summer Undergraduate Research Symposium		2019
4. **Invited Search Committee Member:** National Strategic Planning and Analysis Research Center (NSPARC), Mississippi State University		2018-2019
3. **Volunteered Judge:** MSU graduate teaching assistant (GTA) microteaching exam		2018-2020
2. **Volunteered Commencement Usher:** Spring 2017 MSU Commencement Ceremony		2017
1. **Volunteered Judge:** Spring Undergraduate Research Symposium, Mississippi State University, April 23, 2015		2015

SERVICE ACTIVITIES

Local Community Service

3. **Volunteered Organizer of Training Workshop:** Software Development Principles and Techniques, Base Camp Coding Academy, Spring 2022 • I ran a 2-session virtual workshop on software development principles and techniques with Base Camp Coding Academy Students.		2022

- I gave two 1-hour talks to the attendants and ran a problem-solving session after each talk.

2. **Volunteered Judge:** Mississippi Science and Engineering Fair, April 16, 2019 — 2019

3. **Invited Judge:** Starkville Academy Annual Science Fair, Feb. 07, 2018 — 2018

SERVICE ACTIVITIES

Professional Service: NSF Panelist

2. **Invited:** NSF SHF Proposal Review Panel, spring 2020 — 2022

1. **Invited:** NSF SHF Proposal Review Panel, spring 2019 — 2019

Professional Service: Conference Program Committee

24. **Invited:** The IEEE 32nd International Conference on Requirements Engineering (RE'24) — 2024

23. **Invited:** The IEEE 25th International Conference on Information Reuse and Integration for Data Science (IRI'24) — 2024

22. **Invited:** The 2024 Workshop on Environment-Driven Requirements Engineering (EnviRE'24) — 2024

21. **Invited:** The IEEE 31st International Conference on Requirements Engineering (RE'23) — 2023

20. **Invited:** The 2023 Workshop on Environment-Driven Requirements Engineering (EnviRE'23) — 2023

19. **Invited:** The 2022 Workshop on Environment-Driven Requirements Engineering (EnviRE'22) — 2022

18. **Invited:** The International Conference on Software Engineering and Knowledge Engineering (SEKE'22) — 2022

17. **Invited:** The IEEE 23rd International Conference on Information Reuse and Integration for Data Science (IRI'22) — 2022

16. **Invited:** The 2021 Workshop on Environment-Driven Requirements Engineering (EnviRE'21) — 2021

15. **Invited:** The 27th International Working Conference on Requirements Engineering: Foundation for Software Quality (REFSQ'21) — 2021

14. **Invite:** The International Conference on Software Engineering and Knowledge Engineering (SEKE'21). — 2021

13. **Invited:** The IEEE 29th International Conference on Requirements Engineering (RE'21). — 2021

12. **Invited:** The IEEE 22nd International Conference on Information Reuse and Integration for Data Science (IRI'21) — 2021

11. **Invited:** The IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS), 2020 — 2020

	10. **Invited:** 28th IEEE International Requirements Engineering Conference (RE'20), Zurich, Switzerland, Aug 31 – Sep 4, 2020.	2020
SERVICE ACTIVITIES	9. **Invited:** Artifacts Evaluation Track at the 42nd International Conference on Software Engineering (ICSE'20), Seoul, South Korea, May. 23-29, 2020.	2020
	8. **Invited Program Committee Member:** 1st International Workshop on Self-Protecting Systems (SPS), Umeå, Sweden, 2019	2019
	7. **Invited:** 18th International Conference on Software and Systems Reuse (ICSR'19), Cincinnati, OH, USA, June 26-28, 2019.	2019
	6. **Invited:** RE@Next! Track at the 27th IEEE International Requirements Engineering Conference (RE'19), Jeju Island, South Korea, Sep. 23-27, 2019.	2019
	5. **Invited:** Artifacts Evaluation Track at the 27th IEEE International Requirements Engineering Conference (RE'19), Jeju Island, South Korea, Sep. 23-27, 2019.	2019
	4. **Invited:** RE@Next! Track at the 26th IEEE International Requirements Engineering Conference, Banff, Alberta, Canada, 2018.	2018
	3. **Invited:** ASEE Southeastern Section Conference, Daytona Beach, Florida, March 4-6, 2018	2017
	2. **Invited:** 2nd International Workshop on Just-In-Time RE (JIT RE 2017), in affiliation with the 25rd IEEE International Requirements Engineering Conference (RE 2017), Lisbon, Portugal, Sep 05, 2017.	2017
	1. **Invited:** 1st International Workshop on Just-In-Time RE (JIT RE 2015), in affiliation with the 23rd IEEE International Requirements Engineering Conference (RE 2015), Ottawa, Canada, Aug 25, 2015.	2015
SERVICE ACTIVITIES	**Professional Service: Journal Paper Reviewing**	
	8. **Invited:** ACM Transactions on Software Engineering and Methodology (TOSEM), ACM (Impact Factor: 3.79)	2020-Present
	7. **Invited:** Frontiers of Information Technology & Electronic Engineering, Springer (Impact Factor 1.033)	2019
	6. **Invited:** Software Quality Journal, Springer (Impact Factor 1.596)	2018
	5. **Volunteered**: Requirements Engineering Journal (REJ), Springer (Impact factor: 1.105)	2017-Present
	4. **Invited:** Journal of Industrial Information Integration (JIII), Elsevier (Impact Factor 11.718)	2017
	3. **Invited:** PLOS One Journal	2017
	2. **Refereed:** Information and Software Technology (IST), Elsevier (Impact Factor 3.256)	2013-Present

	1. **Invited:** Journal of Systems and Software (JSS), Elsevier (Impact Factor 2.444)	2010-Present

SERVICE ACTIVITIES

Professional Service: Conference Organizing Committee

	4. **Invited: Poster Chair:** The IEEE 24th International Conference on Information Reuse and Integration for Data Science (IRI'23), 2023	2023
	3. **Invited: Workshops Chair:** The IEEE 23rd International Conference on Information Reuse and Integration for Data Science (IRI'22), 2022	2022
	2. **Invited: Workshops Chair:** The IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI'20), 2020	2020
	1. **Invited: Proceedings Chair:** The 18th International Conference on Software and Systems Reuse (ICSR), Cincinnati, OH, USA, 2019	2019

Professional Service: Other

	7. **Volunteered Session Chair:** The IEEE 23rd International Conference on Information Reuse and Integration for Data Science (IRI'22), 2022	2022
	6. **Volunteered Session Chair:** The IEEE 22nd International Conference on Information Reuse and Integration for Data Science (IRI'21), 2021	2021
	5. **Volunteered Session Chair:** The 27th IEEE International Requirements Engineering Conference (RE'19), Jeju Island, South Korea, 2019	2019
	4. **Volunteered Session Chair:** The 18th International Conference on Software and Systems Reuse (ICSR'19), Cincinnati, OH, USA, 2019	2019
	3. **Refereed Session Chair:** 25th IEEE International Requirements Engineering Conference Workshops (REW), Lisbon, Portugal, 2017	2017
	2. **Invited Article:** Tanmay Bhowmik, "Creativity in Requirements Engineering: Why and How?", IEEE Software Blog, Nov. 2016	2016
	1. **Student Volunteer**: 22nd IEEE International Requirements Engineering Conference (RE 2014), Karlskrona, Sweden, August 25-29, 2014	2014

EXTRA-CURRICULAR INVOLVEMENTS

	5. Board Member, Starkville Multicultural Lion's club Starkville, Mississippi	2014-2015
	4. Volunteer, Starkville Multicultural Lion's club Starkville, Mississippi	2013-2016
	3. Vice-President Communication, Bangladesh Association Mississippi State University	2010
	2. Webmaster, Bangladesh Association Mississippi State University	2009-2010
	1. Coordinator, Chayanika The Art and Cultural Club of NIT Durgapur, India	2006

PROFESSIONAL AFFILIATIONS	3. IEEE Computer Society	2013-Present
	2. Association for Computing Machinery (ACM)	2013-Present
	1. ACM, Mississippi State University Chapter	2010