

# Swaroop Joshi

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## Employment

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE (BITS) PILANI, KK BIRLA GOA CAMPUS · GOA INDIA

- Assistant Professor, Computer Science and Information Systems 2021–present

UNIVERSITY OF UTAH · SALT LAKE CITY UT USA

- Assistant Professor – Lecturer, School of Computing 2019–2020

THE OHIO STATE UNIVERSITY · COLUMBUS OH USA

- Senior Lecturer, Computer Science and Engineering 2017–2019

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY · MUMBAI INDIA

- Senior Project Engineer, GCC Resource Center 2010–2011

SOFTJIN TECHNOLOGIES PVT LTD · BENGALURU INDIA

- Software Engineer 2005–2006

## Education

- *The Ohio State University*, Ph.D. in Computer Science & Engineering 2017
- *The Ohio State University*, M.S. in Computer Science & Engineering 2016
- *Indian Institute of Technology Bombay*, M.Tech. in Computer Science & Engineering 2010
- *National Institute of Technology Karnataka, Surathkal*, B.E. in Computer Engineering 2005

## Publications

### CHAPTERS IN EDITED VOLUMES

1. O. Ahlqvist, **S. Joshi**, R. Benkar, K. Vatev, R. Ramnath, A. Heckler, and N. Soundarajan. *Defining a Geogame Genre Using Core Concepts of Games, Play, and Geographic Information and Thinking*. In: *Geogames and Geoplay: Game-based Approaches to the Analysis of Geo-Information*. Ed. by O. Ahlqvist and C. Schlieder. Springer International Publishing, 2018, pp. 19–35.

### PEER REVIEWED CONFERENCES

1. P. D. Parthasarathy and **S. Joshi**. 2024. *Teaching Digital Accessibility in Computing Education: Views of Educators in India*. In *ACM Conference on International Computing Education Research V.1 (ICER '24 Vol. 1)*, August 13–15, 2024, Melbourne, VIC, Australia. ACM, New York, NY, USA. (**Core A**; Accepted.)
2. P. D. Parthasarathy, I. Kapoor, **S. Joshi**, S. Thomas. 2024. *Influence of Personality Traits on Plagiarism Through Collusion in Programming Assignments*. In *ACM Conference on International Computing Education Research V.1 (ICER '24 Vol. 1)*, August 13–15, 2024, Melbourne, VIC, Australia. ACM, New York, NY, USA. (**Core A**; Accepted.)

3. P. D. Parthasarathy, L. Ganesh, Indra R, S. Spruha, **S. Joshi**. 2024. *Digital Conscience: Investigating the State of Ethics in CS Curricula in India*. In ACM Conference on International Computing Education Research V.1 (ICER '24 Vol. 1), August 13–15, 2024, Melbourne, VIC, Australia. ACM, New York, NY, USA. (**Core A**; Accepted.)
4. P. D. Parthasarathy and **S. Joshi**. 2024. *Exploring the Need of Accessibility Education in the Software Industry: Insights from a Survey of Software Professionals in India*. In Proceedings of the 46th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET '24). Association for Computing Machinery, New York, NY, USA, 212–220.
5. P. D. Parthasarathy and **S. Joshi**. 2024. *Teaching Digital Accessibility to Industry Professionals using the Community of Practice framework: An Experience Report*. In Proceedings of the 46th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET '24). Association for Computing Machinery, New York, NY, USA, 191–200.
6. P. D. Parthasarathy and **S. Joshi**. 2023. *Serious Games for Enhancing Accessibility Awareness and Skills*. In Proceedings of the ACM Conference on Global Computing Education Vol 2 (CompEd 2023). Association for Computing Machinery, New York, NY, USA, 199.
7. J. S. Bhatia, Parthasarathy P D, S. Tiwari, D. Nagpal, and **S. Joshi**. 2023. *Integrating Accessibility in a Mobile App Development Course*. In Proceedings of the 54th ACM Technical Symposium on Computer Science Education V. 1 (SIGCSE 2023), March 15–18, 2023, Toronto, ON, Canada. ACM, New York, NY, USA, 7 pages.
8. D. Nagpal, J. S. Bhatia, D. Goel, Parthasarathy P D, S. Tiwari, and **S. Joshi**. *Inclusive Thinking Questionnaire: Preliminary Results*. In: Proceedings of the 53rd ACM Technical Symposium on Computer Science Education V. 2 (SIGCSE 2022), Mar. 2022, Providence, RI, USA.
9. T. Hattingh, S. Sohoni, A. Agrawal, S. Desai, **S. Joshi**. *An exploration of capacity development of journal reviewers through a mentored reviewer program*. In: Research in Engineering Education Symposium (REES), Dec. 2021, Perth WA, Australia. Australasian Association for Engineering Education.
10. **S. Joshi**. *Teaching Accessibility in India: A Work in Progress*. In: Proceedings of the 17th ACM Conference on International Computing Education Research (ICER 2021), Aug. 2021, Virtual Event, USA.
11. P. Bhattacharya, **S. Joshi**, S. Bandyopadhyay and R. Mittal. *Virtual CS Education in India: Challenges and Opportunities*. In: International Conference on Best Innovative Teaching Strategies (ICON-BITS'21), Jul. 2021, BITS Pilani, India.
12. **S. Joshi**, N. Soundarajan, and J. Morris. *Innovative Approach to Online Argumentation in Computing and Engineering Courses*. In: 125th ASEE Annual Conference and Exposition. American Society for Engineering Education, 2018.
13. N. Soundarajan and **S. Joshi**. *Innovative Approach to Online Argumentation and Models for Structuring the Arguments*. In: 2018 IEEE Frontiers in Education Conference (FIE) (FIE 2018). San Jose, USA, Oct. 2018.
14. **S. Joshi** and N. Soundarajan. *Using Anonymity and Rounds-Based Structure for Effective Online Discussions in STEM Courses*. In: 124th ASEE Annual Conference & Exposition Proceedings. American Society for Engineering Education, 2017.
15. **S. Joshi** and N. Soundarajan. *CONSIDER: A Novel Approach to Conflict-Driven Collaborative Learning in Engineering Courses*. In: 2016 ASEE Annual Conference & Exposition Proceedings. American Society for Engineering Education, June 2016.
16. **S. Joshi** and N. Soundarajan. *Enabling Deep Conceptual Learning in Computing Courses through Conflict-based Collaborative Learning*. In: 2016 IEEE Frontiers in Education Conference (FIE)

- (FIE 2016). Erie, USA, Oct. 2016.
17. **S. Joshi** and N. Soundarajan. *Exploring conflict-based collaborative learning in engineering courses*. In: ASEE North Central Sectional Conference Proceedings. American Society for Engineering Education, Mar. 2016.
  18. **S. Joshi**, N. Soundarajan, and R. Ramnath. *Conflict-Driven Cooperative-Learning in Computing Courses (Abstract Only)*. In: Proceedings of the 46th ACM Technical Symposium on Computer Science Education - SIGCSE '15. Association for Computing Machinery (ACM), Mar. 2015.
  19. N. Soundarajan, **S. Joshi**, and R. Ramnath. *Collaborative and Cooperative-Learning in Software Engineering Courses*. In: 2015 IEEE/ACM 37th IEEE International Conference on Software Engineering. Institute of Electrical & Electronics Engineers (IEEE), May 2015.
  20. N. Soundarajan, **S. Joshi**, and R. Ramnath. *Work-in-Progress: Conflict-Driven Cooperative Learning in Engineering Courses*. In: 2015 ASEE Annual Conference and Exposition Proceedings. American Society for Engineering Education, June 2015.
  21. N. Soundarajan, **S. Joshi**, and R. Ramnath. *Work-in-progress: A novel approach to collaborative learning in the flipped classroom*. In: 121st ASEE Annual Conference and Exposition. American Society for Engineering Education, June 2014.

#### DISSERTATIONS

1. **S. R. Joshi**. *CONSIDER: A Novel, Online Approach to Conflict-Driven Collaborative-Learning*. PhD thesis. The Ohio State University, Aug. 2017.
2. **S. Joshi**. *Extending the Generic Data-Flow Analyzer (gdfa) in GCC*. Master's Project Report. Indian Institute of Technology Bombay, June 2010.

#### REPORTS

1. D. J. Bouvier, E. Lovellette, E. A. Santos, B. A. Becker, T. Crick, V. G. Dasigi, J. Forden, O. Glebova, **S. Joshi**, S. Kurkovsky, and S. Russell. 2023. *Teaching Students To Use Programming Error Messages*. In Proceedings of the ACM Conference on Global Computing Education Vol 2 (CompEd 2023). Association for Computing Machinery, New York, NY, USA, 207–208.
2. S. Bandyopadhyay and **S. Joshi**. *A Report on the Second International Workshop on Software Engineering for Artificial Intelligence (SE4AI 2021)*. In: 14th Innovations in Software Engineering Conference (ISEC 2021). Association for Computing Machinery (ACM), 2021.

#### Awards and Honors

##### TANGIBLE BLOCKS FOR TEACHING COMPUTATIONAL THINKING TO CHILDREN WITH DISABILITIES

- Role: PI (Other PI: Prof. Basavadatta Mitra, Humanities and Social Sci., BITS Goa)
- Agency: GCIR BITS Pilani (Cross Disciplinary Research Funding)
- Budget: INR 20,00,000
- Duration: Jul 2024–Jul 2026

##### USING AI IN ASUS EDUCATION

- Role: PI
- Agency: National Commission for Indian System of Medicine (NCISM)
- Budget: INR 6,21,500
- Duration: Mar–Jul, 2024

##### ACCESSIBLE SCIENCE LABS FOR VISUALLY IMPAIRED SCHOOL CHILDREN

- Role: PI

- Agency: Vision Empower Trust
- Budget: INR 2 L
- Duration: Apr–Nov, 2023

#### HUMAN-CENTERED FUTURE COMPUTING (GOA/ACG/2021–2022/Nov/05)

- Role: PI (Other PIs: Sougata Sen and Sravan Danda)
- Program: Additional Competitive Research Grant
- Agency: Sponsored Research and Consultancy Division, BITS Pilani
- Budget: INR 29.75 L
- Duration: Dec. 10, 2021–Dec. 9, 2023

#### A GIT AND DOCKER BASED TOOLCHAIN FOR INTRODUCTORY PROGRAMMING COURSES

- Role: PI (Co-PI: Pritam Bhattacharya)
- Agency: Teaching Learning Center, BITS Pilani, KK Birla Goa Campus
- Budget: INR 1.45 L
- Duration: Oct. 2021–Mar. 2022

#### SUGAMYATA: ACCESSIBILITY IN COMPUTING EDUCATION (BPGC/RIG/2020–21/04–2021/02)

- Role: PI
- Program: Research Initiation Grant (RIG)
- Agency: BITS Pilani
- Budget: INR 2 L
- Duration: Apr. 2021–Apr. 2023

#### LECTURER TEACHING DEVELOPMENT GRANT, SPRING 2017

- University Center for Advancement in Teaching, The Ohio State University

#### BEST STUDENT PAPER AWARD, 2016

- American Society for Engineering Education, North Central Section

### Invited Talks

#### ANDROID APP DEVELOPMENT WORKSHOP @ YEB 2023: MAR. 29, 2023

- Mobile app development workshop for the participants of the Young Entrepreneurs' Bootcamp at BITS Pilani Goa. The highschool students developed a simple dice game Cho Han.

#### INTEGRATING ACCESSIBILITY TOPICS IN COMPUTING EDUCATION @ IIT BOMBAY: MAR. 24, 2023

- Presentation as part of the weekly seminar at the Education Technology interdisciplinary program at IIT Bombay.

#### POSTMAN API CLASSROOM PROGRAM: API 103, FEB. 2022

- Last of the three modules of Postman's API-based programming course focusing on building a full-stack web application using Glitch, Node.js, Express, axios, handlebar, and Spotify API

#### CPS IN COMPUTING EDUCATION: CURRENT TRENDS, OCT. 2020

- Current Trends in Cyber-Physical Systems (CTiCPS) 2020

#### EFFECTIVELY TEACHING A PRINCIPLES OF PROGRAMMING LANGUAGES COURSE, FEB–APR, 2019

- Indo-Universal Collaboration for Engineering Education, a 10-week web course for 50 CS faculty from various engineering colleges in India

#### COOPERATIVE AND COLLABORATIVE LEARNING IN ENGINEERING CLASSROOMS, JUL. 2018

- Indo-Universal Collaboration for Engineering Education Webinar, attended by over 100 engineering faculty across India

### Service

#### JOURNAL EDITORIAL BOARD

- Associate Editor, Journal of Engineering Education Transformations, 2018–2022

#### JOURNAL REVIEWER

- IEEE Transactions on Education
- Frontiers in Computer Science
- Journal of Engineering Education Transformations
- The ASEE Computers in Education (CoED) Journal
- SAIEE Africa Research Journal

#### SENIOR PROGRAM COMMITTEE MEMBER

- ACM SIGCSE Technical Symposium: 2024
- ACM CompEd: 2023
- ACM India Compute: 2023

#### CONFERENCE PROGRAM COMMITTEE MEMBER

- ACM SIGCSE Technical Symposium: 2023, 2022, 2021, 2019, 2018
- Research in Engineering Education Symposium (REES): 2021
- ASEE Annual Conference & Exposition: 2021, 2019, 2018, 2017, 2016
- IEEE Frontiers in Education (FIE): 2018, 2017, 2016
- IEEE Teaching, Assessment and Learning for Engineering (TALE): 2018
- Midwest Instruction and Computing Symposium (MICS): 2020.

#### CONFERENCE OR WORKSHOP ORGANIZER

- *Co-organizer*, Software Engineering for Artificial Intelligence (workshop), ACM 14th Innovations in Software Engineering Conference, online, Feb. 2021

#### LEADERSHIP

- *Secretary-Treasurer*, ASEE Computers in Education Division, 2018–2020

#### BITS PILANI

- Member, Departmental Committee on Academics (DCA): Oct. 2023–Jun. 2024
- Doctoral Advisory Committee
  - Aishwarya Parab, CSIS (Supervisor: Dr. Arnab Paul, Co-supervisor: Dr. Kunal Korgaonkar), Title: *A Scalable and Upgradable Framework for Decentralized Applications Leveraging Smart Contracts in Blockchain*: Apr 2024–present

- Saumya Mathkar, CSIS (Supervisor: Dr. Vinayak Naik), Title: *A Scalable Cloud and Edge-based Framework to Ease The Deployment of IoT-based Applications*: Aug 2023–present
- Nitish Yadav, CSIS (Supervisor: Dr. Rajesh Kumar), Title: *Periculo-Procuratio: Analytical tools and techniques for integrated safety-security risk analysis*: May 2023–(Discontinued)
- Guest speakers hosted
  - Dr. Dominique Blouin, Telecom Paris, France, *An Introduction to Model-Based Systems Engineering and Multi-Paradigm Modeling for the Development of Complex Cyber-Physical Systems*: November 2023
  - Dr. Viraj Kumar, IISc, *Should Programming Pedagogy and Assessment Change in Response to Advances in Generative AI?*: April 2023
  - Dr. Santosh Nagarakatte, Rutgers University, *A Case for Correctly Rounded Math Libraries*: March 2023
  - Mr. Prasad Ranganekar, Former Advisor, Tata Aerospace Systems Ltd., India @ 75: *Dr. Kalam's vision*: Oct. 2022
- Department Level Selection Committee
  - CSIS Faculty hiring: 2022
- Non-Teaching staff hiring committees (Campus/Institute)
  - Graphics & UX/UI Designer (Marketing), Nov.–Dec. 2023
  - Technician (CS & IS), Mar. 2023
- Ph.D. admissions interview panel: Feb. 2021, Aug. 2021, Jan. 2022, Dec. 2022
- Practice School I: 2021, 2022
- Goa Campus Coordinator, Postman Classroom Program: Oct. 2021–present
- Faculty Advisor, DevSoc: Jun. 2022–present

#### UNIVERSITY OF UTAH

- Lecturing faculty search committee, School of Computing, 2019–2020

#### GOVERNMENT BODIES

- *Member, Governing Council*, Goa State Research Foundation, June 2023–present

#### PH.D. THESIS EXTERNAL EXAMINER

- Karunakara Rai B., *Reasoning Methodology for Estimating the Degradation in the Performance of a Real-Time Fault Tolerant System*. PhD thesis. Visvesvaraya Technological University (VTU), Karnataka India, 2019.
- Sahana B., *Analytical Framework for Fault Management in Communication Networks*. PhD thesis. Visvesvaraya Technological University (VTU), Karnataka India, 2022.

## Teaching Experience

#### COMPUTER SCIENCE & INFORMATION SYSTEMS, BITS PILANI, GOA

- CSF111 Computer Programming (Instructor in-charge: Sp'22, Sp'23; Instructor: Sp'24)
- CSF314 Software Development for Portable Devices (Instructor in-charge: Fa'21, Fa'22, Fa'23, Fa'24)

- ISF341: Software Design (Instructor in-charge; coordinated with PJAIT: Fa'23)
- CSF213 Object Oriented Programming (Instructor: Fa'21, Fa'22, Fa'23)
- CSF363 Compiler Construction (Instructor: Sp'21)

#### SCHOOL OF COMPUTING, UNIVERSITY OF UTAH

- Mobile App Development
- Senior Capstone
- Data Structures & Algorithms

#### COMPUTER SCIENCE & ENGINEERING, THE OHIO STATE UNIVERSITY

- Principles of Programming Languages
- Software II: Software Development and Design
- Software I: Components
- Introduction to Computer Programming In Java
- Data Structures Using Java
- Mobile App Development
- C++ Programming
- Introduction to Computer Programming in C++ for Engineers and Scientists

#### Teaching Areas

- Programming Languages
- Mobile App Development
- Compiler Construction and Optimization
- CS1/CS2

#### Professional Memberships

- Institute of Electrical and Electronics Engineers (IEEE)
  - Education Society
  - Computer Society
- Association for Computing Machinery (ACM)
  - Special Interest Group on Computer Science Education (SIGCSE)
  - Special Interest Group on Accessible Computing (SIGACCESS)
  - Special Interest Group on Software Engineering (SIGSOFT)