

Pooja Rani

Personal Details

Name Pooja Rani
Position Postdoctoral Researcher (Senior researcher)
Work address Department of Informatics (IFI), University of Zurich
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Work Experience

09/2022 – **Senior Researcher**, University of Zurich, Switzerland.
now Zurich Empirical Software Engineering Team chaired by Prof. Alberto Bacchelli
02/2022 – **Early Post-doc**, University of Bern, Switzerland.
08/2022 Software Engineering Group chaired by Prof. Timo Kehrer
06/2017 – **Software Developer**, People Interactive Group pvt. ltd., Mumbai, India.
11/2017 Changing underlying architecture and migrating code to NodeJS framework
01/2017 - **Research Intern**, VMware Software India pvt ltd., Bangalore, India.
06/2017 Developing a framework for automating identity access management flow
2011 – 2014 **Software Tester**, Samsung Research Institute, Noida, India.
Mobile testing: creating test plan, resource planning, design and execute test cases

Education

2018 – 2022 **Ph.D., in Software Engineering**, University of Bern, Switzerland, Advisors: Prof. Oscar Nierstrasz and Dr. Sebastiano Panichella, Grade: summa cum laude (6/6).
2015 – 2017 **Masters of Engineering in Software System**, Birla Institute of Technology and Science-Pilani, Rajasthan, India, *GPA – 8.53/10*.
2011 – 2014 **Bachelor of Engineering in Computer Science**, The Institution of Engineers, Kolkata, India, *GPA – 8.33/10*.
2008 – 2011 **Diploma in Computer Science and Engineering**, Kalpana Chawla Government Polytechnic for Women, Haryana, India, *Percentage – 83*.

Teaching Experience

More details about the courses are available online at <https://poojaruhal.github.io/teaching/>

- 2023–2024 **Seminar in Empirical Software Engineering**, Lecturer at University of Zurich.
12 students; Proposing various research projects, and managing their progress
- 2018 – 2022 **Object-Oriented Programming (BSc)**, Instructor at University of Bern.
Approx. 100 students; Object-oriented paradigms using Java, Smalltalk, C++.
- 2018 – 2022 **Seminar in Software Engineering (BSc/MSc)**, Instructor at University of Bern.
Approx. 15 students; Research projects to show the current research landscape in SE.
- 2018 – 2020 **Software Modeling Analysis (MSc)**, Instructor at University of Bern.
Approx. 30 students; Overview of modeling techniques to analyze complex software systems.
- Autumn 2016 **Software Testing (ME)**, Teaching Assistant at BITS Pilani.
Approx. 25 students; Software testing concepts, designing and correcting exercises.
- Spring 2016 **Computer Programming (BE)**, Teaching Assistant at BITS Pilani.
Approx. 100 students; C language concepts, organizing exercises, and correcting exercises.
- Autumn 2015 **Computer Architecture (BE)**, Teaching Assistant at BITS Pilani.
Approx. 50 students; Computer Architecture concepts, designing and correcting exercises.

Mentoring & Supervision (PhD/MSc/BSc) Experience

The list of supervised projects and students is available online: <https://poojaruhal.github.io/teaching/>

PhD

- 2022-now Shirin Pirouzkhah, “Automating code reviews”, University of Zurich.
- 2023–now Pavlina Goncalves, “Communication in code reviews”, University of Zurich.
- 2022 Fernando Petruccio, “Bug prediction”, University of Zurich.
- 2022-now Alexander Boll, “Exploring Simulink documentation”, University of Bern.

MSc

- 2022 Veronika Wu “Developer awareness in Sustainable Software Engineering”, University of Bern.
- 2020 Mathias Bierrer “Analysis of Developer Information Needs on Collaborative Platforms”, University of Bern.

BSc

- 2024 Mohammad Eglil “Commenting practices of polyglot developers”, University of Bern.
- 2023 Adrian Suter “Automated vs Manual Tests”, University of Zurich.
- 2021 Michael Dooley “Tool Support for Commenting Conventions”, University of Bern.
- 2021 Suada Abukar “Adherence of comments to the style guidelines”, University of Bern.
- 2020 Lino Hess “Generating automatically class comments in Pharo”, University of Bern.
- 2018 Jonas Richner “Software Developers? Information Needs”, University of Bern.

2018 Sabine Brunner “Inconsistency between Comments and Code”, University of Bern.
2018-2022 Supervised 12 students for independent seminar research projects.

Journal Publications

The replication packages, datasets, and slides for all papers are available online at <https://poojaruhal.github.io/publications/>

- EMSE Pooja Rani, Fernando Petrulio, and Alberto Bacchelli. “On Refining the SZZ Algorithm with Bug Discussion Data”, *Empirical Software Engineering*, 2023, Under Major Revision.
- JSS Alexander Boll, Pooja Rani, Alexander Schultheiss, and Timo Kehrer. “Beyond Code: Is There a Difference between Comments in Visual and Textual Languages?”, *Journal of Systems & Software*, Under Minor Revision.
- JSS Pooja Rani, Arianna Blasi, Nataliia Stulova, Sebastiano Panichella, Alessandra Gorla, and Oscar Nierstrasz. “A decade of code comment quality assessment: A systematic literature review”, *Journal of Systems & Software*, 2022, 111515.
- EMSE Pooja Rani, Sebastiano Panichella, Manuel Leuenberger, Mohammad Ghafari, and Oscar Nierstrasz. “What do class comments tell us? An investigation of comment evolution and practices in Pharo Smalltalk”, *Empirical Software Engineering*, 26, 6, 2021, 1–49.
- JSS Pooja Rani, Sebastiano Panichella, Manuel Leuenberger, Andrea Di Sorbo, and Oscar Nierstrasz. “How to Identify Class Comment Types? A Multi-language Approach for Class Comment Classification”, *Journal of Systems & Software*, 181, 2021, 111047.

Conference Publications

- ICSE Pooja Rani, Jonas Zellweger, Veronika Kousadianos, Luis Cruz, Timo Kehrer, Alberto Bacchelli, “Energy Patterns for Web: An Exploratory Study”, *International Conference on Software Engineering, Society Track*, 2024.
- FSE Christian Birchler, Tanzil Kombarabettu Mohammed, Pooja Rani, Teodora Nechita, Timo Kehrer, Sebastiano Panichella, “Does Simulation-based Testing for Self-driving Cars match Human Perception?”, *Foundations of Software Engineering*, 2024.
- Findings at EMNLP Joel Niklaus, Veton Matoshi, Pooja Rani, Andrea Galassi, Matthias Sturmer, Ilias Chalkidis, “LEXTREME: A Multi-Lingual and Multi-Task Benchmark for the Legal Domain”, 2023.
- ICCS Christos Tsigkanos, Pooja Rani, Sebastian Muller, and Timo Kehrer, “Variable Discovery with Large Language Models for Metamorphic Testing of Scientific Software”, *International Conference on Computational Science (ICCS)*, 2023.
- SANER Christos Tsigkanos, Pooja Rani, Sebastian Muller, and Timo Kehrer, “Large Language Models: The Next Frontier for Variable Discovery within Metamorphic Testing?”, *30th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER)*, 2023.

- SCAM Pooja Rani, Mathias Birrer, Sebastiano Panichella, Mohammad Ghafari, and Oscar Nierstrasz, "What Do Developers Discuss about Code Comments?", *IEEE 21st International Working Conference on Source Code Analysis and Manipulation (SCAM)*, 2021.
- SCAM Pooja Rani, Suada Abukar, Nataliia Stulova, Alexander Bergel, and Oscar Nierstrasz, "Do Comments follow Commenting Conventions? A Case Study in Java and Python", *IEEE 21st International Working Conference on Source Code Analysis and Manipulation (SCAM)*, 2021.
- SANER Pooja Rani, Mathias Birrer, Sebastiano Panichella, and Oscar Nierstrasz, "Makar: A framework for multi-source studies based on unstructured data", *International Conference on Software Analysis, Evolution and Reengineering*, 2020.

Thesis & Workshop Publications

- Thesis Pooja Rani, "Assessing Comment Quality in Object-Oriented Languages", University of Bern, Switzerland, 2022, <https://boristheses.unibe.ch/3382/>.
- IWST Pooja Rani, Alexandre Bergel, Lino Hess and Timo Kehrer, and Oscar Nierstrasz, "Can We Automatically Generate Class Comments in Pharo?", *International Workshop on Smalltalk Technologies (IWST)*, 2022.
- ICSE Pooja Rani, "Speculative analysis for comment quality assessment", *International Conference on Software Engineering, Doctoral Symposium*, 2021.
- SaTToSE Pooja Rani, "Software Analysis using Natural Language Queries", *Seminar Series on Advanced Techniques & Tools for Software Evolution (SATTtoSE)*, 2018.

Achievements & Awards

- 2023 Distinguished Reviewer Award at International Conference on Mining Software Repositories (MSR), Melbourne, Australia
- 2023 Distinguished Service Award at International Workshop on Natural Language-based Software Engineering (NLBSE), Melbourne, Australia
- 2022 Best PhD thesis award in computer science institutes of the University of Bern, Neuchatel, and Fribourg at Bern, Switzerland
- 2022 Best research paper award at International Workshop on Smalltalk Technologies (IWST), Novi Sad, Serbia
- 2022 Received 'summa cum laude' for PhD dissertation, Bern, Switzerland
- 2018 Best presentation award at Seminar Series on Advanced Techniques & Tools for Software Evolution (SATTtoSE), Athens, Greece
- 2012 Received the youngest employee of the year award in Samsung, Noida, India
- 2011 Secured 1st Rank in the three-year diploma program, Ambala, India
- 2010 Runners-up position in inter-college youth festival dance competition, Haryana, India
- 2007 Won Silver Medal in the state-level Taekwondo Championship, Haryana, India

Fundings

- 2015-2017 Research fellowship for Masters from MHRD (Ministry of Human Research Development), India
- 01/04/2024 *"EnergyInsight: Charting and Reducing the Energy Footprint of Scientific Software and Data-Analysis Pipelines"*, Hasler Stiftung, Switzerland. Under Submission

Invited Talks

- 04/2023 *"Comprehending Software Pidgins"*, University of Konstanz, Konstanz, Germany
- 10/2022 *"Women in STEM"*, University of Bern, Bern, Switzerland
- 07/2022 *"Decoding commenting practices?"*, University of Zurich, Zurich, Switzerland

Presentations at International Venues

All slides are available online at <https://poojaruhal.github.io/talks/>

- ESEM 2023 *"A decade of code comment quality assessment: A systematic literature review"*, ACM/IEEE International Symposium on Empirical Software Engineering and Measurement, New Orleans, USA.
- IWST 2022 *"Can We Automatically Generate Class Comments in Pharo?"*, International Workshop on Smalltalk Technologies, Novi Sad, Serbia
- ICSE 2022 *"What do class comments tell us? An investigation of comment evolution and practices in Pharo Smalltalk"* International Conference on Software Engineering, Pittsburg, USA
- SANER 2022 *"How to Identify Class Comment Types? A Multi-language Approach for Class Comment Classification"*, International Conference on Software Analysis, Evolution and Reengineering, Virtual.
- SCAM 2022 *"What Do Developers Discuss about Code Comments?"*, International Working Conference on Source Code Analysis and Manipulation, Virtual.
- SCAM 2022 *"Do Comments follow Commenting Conventions? A Case Study in Java and Python"*, International Working Conference on Source Code Analysis and Manipulation, Virtual.
- ICSE 2021 *"Speculative analysis for comment quality assessment"*, International Conference on Software Engineering, Virtual.
- SANER 2020 *"Makar: A framework for multi-source studies based on unstructured data"*, International Conference on Software Analysis, Evolution and Reengineering, Virtual.
- INRIA 2019 *"Comment soup with a pinch of types, served in a leaky bowl"*, Pharo Days, INRIA, Lille, France.
- SATToSE 2018 *"Software Analysis using Natural Language Queries"*, Seminar Series on Advanced Techniques & Tools for Software Evolution (SATToSE), Athens, Greece.
- Linguistics 2018 *"Let Linguistics guide software analysis"*, Les Diablerets, Switzerland.

Scientific Service

Program Committee Memberships

- GREENS International Workshop on Green and Sustainable Software, 2024
- SANER International Conference on Software Analysis, Evolution and Reengineering, 2024
- ESEM International Symposium on Empirical Software Engineering and Measurement, 2024
- MSR International Conference on Mining Software Repositories: 2022-now
- ICSME International Conference on Software Maintenance and Evolution: NIER track, 2023
- ISEC Innovations in Software Engineering Conference: 2022-now
- NLBSE International Workshop on Natural Language-based Software Engineering: 2021-now
- IWST International Workshop on Smalltalk Technologies: 2023-now

Organizing Committee Memberships

- MSR International Conference on Mining Software Repositories: 2024
- NLBSE International Workshop on Natural Language-based Software Engineering: 2024

Journal Reviews

- EMSE Empirical Software Engineering: 2023
- TSE IEEE Transactions on Software Engineering: 2023
- EAAI Engineering Applications of Artificial Intelligence: 2023
- JSS Journal of Systems & Software: 2022
- TOSEM ACM Transactions on Software Engineering and Methodology: 2021-now
- IST Information and Software Technology: 2021-now

Conference Reviews as a co-reviewer

- ICSE International Conference on Software Engineering: 2022
- ICCS International Conference on Computational Science: 2022
- SANER International Conference on Software Analysis, Evolution and Reengineering: 2019, 2020
- SCAM International Working Conference on Source Code Analysis and Manipulation: 2018, 2020

Organization

- 2022, 2023 Organizing tool competition at Natural language-based software engineering workshop (NLBSE)

Academic Committees

- 2021 Appointment Committee, Professorship, University of Bern, 2021

Membership

- Since 2019 Board Member of CHOOSE group (Swiss group for Software Engineering)

2021 Mentor in the Womentoring program at University of Bern

International Training & Schools

- 2023 “International Summer School on Software Engineering”, Lugano, Switzerland.
- 2022 “Learning by Doing: supervising students in hands on projects”, Zurich, Switzerland.
- 2021 “Practical Crowdsourcing”, by Takola, Switzerland.
- 2019 “Winter School on Deep Learning”, Lenk Im Simmental, Switzerland.
- 2018 “International Summer School on Software Engineering”, Lugano, Switzerland.
- 2018 “Current Methods in Corpus Linguistics”, Les Diablerets, Switzerland.

Research Collaborations

- Ongoing Margaret-anne Storey, University of Victoria, Canada
Developer Productivity.
- Ongoing June Sallou, Delft University of Technology, Netherlands
Energy Estimation for Software Development.
- Ongoing Steven Costiou, Inria in RMoD, France
Object-Centric Debugging.
- Ongoing Christos Tsigkanos, University of Athens, Greece
Using language models for software testing.
- Ongoing Timo Kehrer, University of Bern, Switzerland
Software product lines.
- Ongoing Joel Nikalus, Digital Sustainability Research Center, Switzerland
Natural language processing for the legal domain.
- Ongoing Luis Cruz, Delft University of Technology, Netherlands
Understanding sustainability aspects in SE.
- 2020 Nataliia Stulova, University of Bern, Switzerland
Code commenting practices in SE.
- 2020 Alessandra Gorla, IMDEA Software Institute, Spain
Comment quality assessment practices in SE.
- 2019 Alexandre Bergel, University of Chile, Chile
Building visualizations for SE data.
- Ongoing Andrea Di Sorbo, University of Sannio, Italy
Applying NLP techniques to SE data.
- Ongoing Sebastiano Panichella, Zurich University of Applied Science, Switzerland
Empirical software engineering.

More Details

- Hobbies Cycling, dancing, hiking, cooking, reading historical books
- Language English (fluent), Hindi (native), Haryanvi (native), Punjabi (A2), German (A2.1)