Nadia Nahar

Ph.D. Student in Software Engineering
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Education

Present
Fall 2020
Doctor of Philosophy in Software Engineering
Carnegie Mellon University (CMU), Pittsburgh, PA, USA
Advisor : Christian Kästner. (Area : Software Engineering for Machine Learning)

June 2016
Jan 2015
Master of Science in Software Engineering
Institute of Information Technology (IIT), University of Dhaka, Dhaka, Bangladesh
CGPA : 4.00 out of 4.00 (Gold Medalist for Highest CGPA)

Dec 2014
Jan 2011
Bachelor of Science in Software Engineering
Institute of Information Technology (IIT), University of Dhaka, Dhaka, Bangladesh
CGPA : 3.99 out of 4.00 (Gold Medalist for Highest CGPA)

Professional Experience

Summer 2024
Research Intern, Microsoft Research, Microsoft
Large Language Models | Copilot | Empirical Research | Interview | Survey | SE4ML | Challenges and Solutions

Summer 2022
Software Engineering Intern, Deep Learning Inference Service (DLIS), Microsoft
Deep Learning Inference | GPU Model Deployment | MLOps | DLIS | ITP | Singularity | AWS

May 2017
August 2020
Lecturer, University of Dhaka, Dhaka, Bangladesh
Teaching SE Course | Conducting SE Research | Organizing SE Workshops | Designing Curricula and Course Materials

February 2016
January 2017
Senior Software Engineer | Web Developer, Icebreakers, Dhaka, Bangladesh
Selenium | .Net | C# | AngularJs | Bootstrap | Visual Studio | SQL Server | IntelliJ Idea | Maven | Apache Tomcat

Teaching Experience

Spring 2025
Instructor, Foundations of Software Engineering (17-313), Carnegie Mellon University
`https://cmu-313.github.io/`
Co-taught with CMU faculty as *instructor of record*. Total 63 Undergrads. Designed and delivered lectures about Architecture, Microservices, AI/ML/LLM, and Engineering ML systems. Created homework and exam questions and rubrics. Held staff meetings and instructed TAs. Managed student concerns and conflicts.

Spring 2022
Teaching Assistant, Machine Learning in Production (17-645), Carnegie Mellon University
`https://ckaestne.github.io/seai/`
Designed and delivered Recitations. Created and graded Assignments and Exams. Held Office Hours.

May 2017
August 2020
Lecturer, University of Dhaka, Dhaka, Bangladesh
`http://www.iit.du.ac.bd/about_iit/individual_teacher/71`
Taught 15 different courses for software engineering (e.g, Design Patterns, Software Quality Assurance, and Software Design) undergraduate and graduate classes; many multiple times during different semesters. Designed course curriculum, lectures, exam, assignments, and other materials for SE courses. Conducted technical workshops for students and professionals. Conducted SE research and published papers.

Research Interests

Software Engineering, Software Engineering for Machine Learning (SE4ML), Collaboration in ML System, Responsible AI

Research Projects

- **Collaboration Challenges in Building Machine Learning (ML) Products :** Interdisciplinary collaboration has always been considered challenging which stands true for modern ML products as well. To better understand collaboration challenges and avenues toward better practices, I have conducted interviews with 45 participants contributing to the development of ML-enabled systems for production use. We report our findings in this paper, published in **ICSE 2022** and received **ACM SIGSOFT Distinguished Paper Award**. The talk can be found here.

- **Emerging Solutions for Integrating Large Language Models (LLMs) into Software Products :** Unique characteristics of LLMs force developers, who are accustomed to traditional software development and evaluation, out of their comfort zones as the LLM components shatter standard assumptions about software systems. This study explores the emerging solutions that software developers are adopting to navigate the encountered challenges. I leveraged mixed-method research, including 26 interviews and a survey with 332 responses, and identified 19 emerging solutions regarding quality assurance. We report our findings in this paper, published in **ICSE 2025-SEIP** track.
- **Facilitate Collaboration for Requirements Elicitation :** This is an ongoing study, which aims to design and evaluate an intervention to enhance effective negotiations among cross-disciplinary development teams. It focuses on using a boundary object to elicit and agree on actionable model requirements. My proposed solution involves developing an assistant that leverages LLMs for knowledge translation, contextual explanation, and conflict resolution, enabling data scientists and software engineers to reach consensus on model specifications.
- **Facilitate and Encourage Responsible AI (RAI) Engagement :** This study emerged from a collaboration with an industry partner facing challenges in adopting RAI. We observed tensions, particularly when data scientists, despite company mandates, remained resistant or indifferent to ethical considerations in ML product development. Recognizing the need for a transformative and politically nuanced approach, I designed and evaluated an intervention to align interests and foster agreements. This approach leverages LLMs to create compelling stories about the potential harm ML products can inflict on end-users, encouraging data scientists and software engineers to engage meaningfully with RAI principles.
- **Analyzing ML Products in Open Source :** Despite the rising use of machine learning (ML), developers still struggle to transition from ML prototypes to final products. Academic researchers often find it difficult to suggest solutions or assess these challenges due to their lack of access to the industry's closed-source ML products. In this study, I have defined, identified, and analyzed open-source ML products. I have curated and analyzed a dataset of 262 repositories from GitHub, which resulted in 21 findings related to various development activities. The paper has been published in **ICSE 2025**.
- **Policy Design as a Guidance for Satisfying Explainable AI (XAI) Requirements :** In collaboration with Yale University's Medical and Social Science researchers, we designed a policy for governing and guiding XAI implementation through an experimental study involving an interdisciplinary team of ML and policy researchers. The observations and lessons from the policy design experiment are published in FAccT 2024 and AIES 2024. We are currently evaluating the policy's effectiveness through a large-scale controlled experiment in an educational setting.

Selected Publications (Visit Scholar for more)

- Z. A. Omar*, **N. Nahar***, J. Tjaden, I. M. Gilles, F. Mekonnen, J. Hsieh, C. Kästner, A. Menon, "Beyond Accuracy, SHAP, and Anchors – On the Difficulty of Designing Effective End-user Explanations", *(Under Review)*, 2025.
- **N. Nahar**, H. Zhang, G. Lewis, S. Zhou, and C. Kästner, "The Product Beyond the Model – An Empirical Study of Repositories of Open-Source ML Products", In Proc. 47th International Conference on Software Engineering (*ICSE*), 2025.
- **N. Nahar** et al., "Regulating Explainability in Machine Learning Applications–Observations from a Policy Design Experiment", In Proc. ACM Conference on Fairness, Accountability, and Transparency (*FAccT*), 2024.
- A. Bhat*, A. Coursey*, G. Hu, S. Li, **N. Nahar**, S. Zhou, C. Kästner, and J. L. Guo, "Aspirations and Practice of ML Model Documentation : Moving the Needle with Nudging and Traceability", In Proc. 2023 CHI Conference on Human Factors in Computing Systems (*CHI*), 2023.
- **N. Nahar** et al., "A Meta-Summary of Challenges in Building Products with ML Components–Collecting Experiences from 4758+ Practitioners", In Proc. 2nd International Conference on AI Engineering – Software Engineering for AI (*CAIN*), co-located with ICSE, 2023. (Candidate for Distinguished Paper Award, and Received **Ivica Crnkovic Early Career Researcher Award**)
- **N. Nahar**, S. Zhou, G. Lewis, and C. Kästner, "Collaboration Challenges in Building ML-Enabled Systems : Communication, Documentation, Engineering, and Process", In Proc. 44th International Conference on Software Engineering (*ICSE*), 2022. (Received **ACM SIGSOFT Distinguished Paper Award**)
- KK. Ganguly, **N. Nahar**, and BMM. Hossain, "A Machine Learning-based Prediction and Analysis of Flood Affected Households : A Case Study of Floods in Bangladesh", International Journal of Disaster Risk Reduction (IJDRR), 2019.

Special Awards Received in Research and Academia

- Ivica Crnkovic Early Career Researcher Award, International Conference on AI Engineering – Software Engineering for AI, 2023
- ACM SIGSOFT Distinguished Paper Award, International Conference on Software Engineering (ICSE), 2022.
- IIT Academic Excellence Gold Medal Award (Master's), University of Dhaka, 2016.
- IIT Academic Excellence Gold Medal Award (Bachelor's), University of Dhaka, 2014.

Prizes In Co-curricular Activities

- Champion (1st position) of BASIS Code Warriors Challenge, Web Development .Net Track, 2015.
- 1st Runner-up in "Project Showcasing", 2nd DUITS Campus IT Fest, 2013 for the project "Ghost in the Town", a 3d game.
- 6th Position in National Collegiate Programming Contest (Women), 2011.
- Attended ACM International Collegiate Programming Contest (ICPC) 2011, 2012, Quazi Azher Ali National Programming Contest 2011, 2012, IUT National ICT Fest, Paradana University, Bangladesh University Programming Contest and many more.

Services

- **Reviewer** @ ACM CHI conference on Human Factors in Computing Systems, 2025.
- **Reviewer** @ Transactions on Computer-Human Interaction (TOCHI).
- **Reviewer** @ Empirical Software Engineering (EMSE), Springer.
- **Organizing Committee : Publicity Chair** @
  3rd International Conference on AI Engineering – Software Engineering for AI (**CAIN**), Lisbon, Portugal, 2023.
- **Organizing Committee : Registration Chair** @
  44th International Conference on Software Engineering (**ICSE**), Pittsburgh, PA, USA, 2022.
- Member @ **Teaching Track Hiring Committee**, Software and Societal Systems Department (S3D), CMU, 2022-23, 2023-24.
- Member @ **SSSG (Weekly Software Research Seminar) Steering Committee**, S3D, CMU, 2022-23.
- Member @ **Software Engineering PhD Admission Committee**, CMU, 2021-22.
- Member @ **Research Experiences for Undergraduates in Software Engineering (REUSE) Admission Committee**, CMU, 2021.
- **Mentor** to Undergraduate Summer Interns @ **REUSE**, CMU, Summer 2021, Summer 2023, Summer 2024, Summer 2025.
- **Workshop Trainer and Co-ordinator**
  - Resource Person of the Teachers' Training Program under the College Education Development Project (CEDP) of the World Bank, Conducted by the National University of Bangladesh, 2019.
  - Speaker on Software Engineering in IT Awareness Workshops such as TechCrunch-2018 and TechCrunch 2.0-2019.
- **Co-ordinator in Software Competitions** such as Institutional Project Showcasing held in 2018 & 2019, Programming Contest named as Independence Cup held in 2018 & 2019.
- **Hackathon and Software Contest Instructor** for University of Dhaka from 2018 to 2020.
- **Technical Workshop Organizer** (e.g. DevOps-2019, 4th IR-2019, etc.).

Recent Talks

- AI Integrator Engineer Workshop, **Microsoft**, March 6, 2025.
- Internal Research and Workshop Talks within Microsoft (HCAIX, NFoW, Demo day, etc), **Microsoft**, 2024.
- Academic Guest Talk on **ISaCTN Technical Symposium**, June 23, 2023.
- Podcast with **DataTalks.Club** : Season 13, episode 5, "SE4ML - Software Engineering for Machine Learning", Mar 16, 2023. Video : `https://www.youtube.com/watch?v=35Ch8xL2SA8`, Podcast Available in : Apple, Spotify, Anchor.
- November Tech Talk @ Microsoft Reactor (Online and In-Person), by **Data Circles**, Nov 10, 2022.
- **Iterative AI October Meetup**, "Collaboration Challenges in Building ML-Enabled Systems with Nadia Nahar", Oct 13, 2022. Video : `https://www.youtube.com/watch?v=FKdVSNfnD_M`.
- Guest Lecture on Software Engineering for Machine Learning : CMU 17-313 : Foundations of Software Engineering, **Carnegie Mellon University (CMU)**, Spring 2023, Fall 2022.
- Guest Lecture on Collaboration Challenges in Building ML-enabled Systems : Machine Learning in Production / AI Engineering (17-445/17-645/17-745/11-695), **CMU**, Spring 2022.

Technical Skills

Languages/Frameworks	Python, Jupyter Notebook, R, Java, Vue JS, Streamlit, NodeBB, C#, C, C++, HTML, CSS, JavaScript, Knockout JS, Angular JS, Cordova, Ionic, etc.
Other Tools	Github, Docker, Jenkins, Prometheus, Grafana, Apache Kafka, Amazon EC2, Kubernetes, Selenium, JMeter, Autodesk Maya, Autodesk 3ds Max, Unity Game Engine, etc.
Databases	MSSQL, Oracle, MySQL, PostgreSQL, MongoDB

References

Christian Kästner
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Institute for Software Research, Carnegie Mellon University
@ kaestner@cs.cmu.edu

Ken Holstein
Assistant Professor
Human-Computer Interaction Ins., Carnegie Mellon University
@ kjholste@andrew.cmu.edu

Grace Lewis
Principal Researcher
Software Engineering Institute (SEI), Carnegie Mellon University
@ glewis@sei.cmu.edu