

DIPAYAN BANIK

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Research Interests

Empirical software engineering; large language model (LLM) agents in software development; automated code review and pull-request analysis; software maintenance and breaking-change analysis; applied data science for power-system modeling and long-term resource planning.

Education

Tennessee Technological University

B.S. in Computer Science, Concentration in Data Science

– GPA: 3.91 / 4.00

December 2021

Cookeville, TN

Publications

Peer-Reviewed Conference Publications

Nazir, S., Othman, H., Vu, K., Wang, S., Banik, D., Bera, A., ... Ellison, J. (2022). *pirp: A probabilistic tool for long-term integrated resource planning of power systems*. In *2022 IEEE Electrical Energy Storage Application and Technologies Conference (EESAT)* (p. 1-5). doi: 10.1109/EESAT55007.2022.9998029

Preprints and Manuscripts

Chowdhury, K., Banik, D., Ferdous, K. M., & Shamim, S. I. (2026). *From industry claims to empirical reality: An empirical study of code review agents in pull requests*. Retrieved from <https://arxiv.org/abs/2604.03196>

Ferdous, K. M., Banik, D., Chowdhury, K., & Shamim, S. I. (2026). *Safer builders, risky maintainers: A comparative study of breaking changes in human vs agentic prs*. Retrieved from <https://arxiv.org/abs/2603.27524>

Other Publications

Halder Lina, D., & Banik, D. (2020, May). Lake Storage Observation by Citizen and Satellite. *Proceedings of Student Research and Creative Inquiry Day, 4*. Retrieved from <https://publish.tntech.edu/index.php/PSRCI/article/view/682>

Teaching Experience

Tennessee Technological University

Undergraduate Teaching Assistant, Department of Computer Science

August 2018 – April 2020

Cookeville, TN

- Supported instruction for introductory programming and data-structures courses, including preparation of lab quizzes and assignments
- Mentored 30+ students per semester in laboratory sessions, strengthening their understanding of C++ fundamentals

Professional Experience

Danovo Energy Solutions

Engineer II

May 2022 – Present

Raleigh, NC

- Built a FastAPI microservice architecture orchestrating parallel PSSE/PSCAD simulation runs, paired with a TypeScript dashboard for side-by-side time-series comparison of power-system models
- Implemented channel classification and scoring to automatically surface point-of-interconnection (POI) measurements from hundreds of raw signals, plus version overlay for iterative model tuning
- Delivered GIS analysis, cartographic products, and power-flow modeling in support of utility and data-center interconnection planning

- Developed database solutions and authored PL/SQL procedures and triggers in Oracle APEX to automate cross-functional business workflows

Adtran

Aug.–Dec. 2020; May–Aug. 2021

Engineering Co-op

Huntsville, AL

- Wrote automated `pytest` coverage, performed smoke testing, and validated Jira stories for the TA5000 switch module
- Migrated and modernized TA5k-ftp packages from Perforce to GitHub, reducing package pull time by roughly half

Clayton Homes

June 2020 – August 2020

Software Engineering Intern

Maryville, TN

- Built and automated a quoting interface for Clayton Retailer Unit using AngularJS, MVC, and .NET, delivering an approximately 2x faster end-user workflow
- Collaborated on development, testing, and deployment pipelines using Git, Jira, TeamCity, and Octopus Deploy

Honors and Awards

Distinguished Mining Challenge Best Presentation Award, Mining Software Repositories 2026

Safer Builders, Risky Maintainers: A Comparative Study of Breaking Changes in Human vs Agentic PRs

Best Poster Award Winner, Tennessee Tech Student Research and Creative Inquiry Day (2020)

Lake Storage Observation by Citizen and Satellite

Dean's List, Tennessee Technological University (multiple semesters; GPA 3.91/4.00)

Technical Skills

Programming Languages: Python, C++, C, Java, JavaScript/TypeScript, R, MATLAB, Julia, SQL, Assembly

Frameworks and Libraries: FastAPI, AngularJS, Ionic, jQuery, .NET, Electron, Chart.js, Tkinter

Tools and DevOps: Docker, Ansible, Jenkins, TeamCity, Octopus Deploy, Git, Jira, Oracle APEX

Platforms: Linux, WSL, Google Cloud Platform, JupyterLab, RStudio, Arduino, Raspberry Pi

Domain Tools: PSSE, PSCAD, GIS / cartographic analysis

References available upon request.