

RITIKA PANDEY

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EDUCATION

Ph.D. Computer Science

Fall 2020 – Summer 2023

Purdue University | Indianapolis, IN

Advisor – Dr. George Mohler, Dr. James Hill

Dissertation – Rewiring police officer training networks to reduce forecasted use of force.

Relevant Courses – Intelligent Systems, Computational modeling of epidemics, Survival analysis, Algorithm design, analysis & implementation.

MS, Computer & Information Science

Spring 2018 – Summer 2020

Purdue University | Indianapolis, IN

Advisor – Dr. George Mohler

Thesis – Text mining for social harm and criminal justice applications

Relevant Courses – Data Mining, Deep Learning, Object-Oriented Programming, Data visualization, Database Systems, Big data analytics.

BTech, Computer Science & Engineering

Fall 2013 – Spring 2017

Uttarakhand Technical University | Dwarahat, India

ACADEMIC AND PROFESSIONAL EXPERIENCE

Research Associate Professor

July 2025 – Present

Boston College School of Social Work | Chestnut Hill, MA

Research Assistant Professor

Oct 2023 – July 2025

Boston College School of Social Work | Chestnut Hill, MA

- Collaborate with the community stakeholders, researchers and external partners including non-profits, government agencies and advocacy groups to design, implement and evaluate data-driven solutions that address pressing social, health, educational, and economic problems.
- Collate, clean and analyze complex datasets from diverse sources and utilize statistical, machine learning, natural language processing techniques to make predictions and insightful recommendations.
- Performing ad-hoc analysis and developing reproducible analytical approaches to meet organization requirements.
- Engage directly with data providers to ensure the data is accurately collected, measured and reported.
- Mentor and guide undergraduate and graduate research assistant in data science methodologies, programming languages and analytical techniques that help them build strong foundations and make informed decisions.
- **Tools/Stacks:** Python, Streamlit, RAG, Dash, Mentoring, Data visualization, Natural language processing, Predictive Modeling, Github.

Research Assistant – Machine Learning

Feb 2018 – Aug 2023

Purdue University | Indianapolis, IN

- Design and develop novel machine learning models aimed at social harm & criminal justice applications.
- Developed network survival models to analyze how police officers' field training networks influence future use of force incidents.
- Designed a network rewiring algorithm to optimize field training assignments, increasing the expected time to a trainee's first use of force incident by 8%.
- Built knowledge graph-based framework for homicide investigation analysis, incorporating named entity recognition and evidence classification to improve case solvability
- Guided & collaborated with Undergraduate Research Interns (REU) to create predictive models analyzing Reddit data to identify transitions between casual drug discussion and recovery forums, providing insights for opioid crisis intervention.
- Investigated role of topic modeling & suggested key metrics (topic coherence, gini coefficient) for detecting crime hotspots allowing for more targeted police intervention.
- **Tools/Stacks:** Python, R, Text Mining, Natural Language Processing, Topic Modeling, Network Analysis, Predictive Modeling.

Data Science Intern – R&D

Summer 2021, Summer 2022

Roche Diabetes Care | Indianapolis, IN

- Implemented advanced analytics techniques and machine learning algorithms to enhance continuous glucose monitoring systems, predict additional components which can be helpful in therapy management.
- **Modeling:** Built boosted neural network for multi-class classification & performed feature engineering to derive valuable insights for model optimization in a distributed environment.
- **Tools/Stacks:** JMP, Python, Boosted Neural Networks, Feature Engineering, JSL, Hyperparameter Tuning, DoE, Data Visualization.

IT Intern (Data Analytics)

Summer 2019

Navient Inc | Fishers, IN

- Built server based analytical model facilitating prediction of application and chargeback keeping humans in the loop.
- **Resolving inconsistencies:** Mined and analyzed server information from various data sources & synchronized it across all platforms.
- Worked closely with the application development team & influenced the development trajectory in migrating from spreadsheets to front-end application.
- **Tools/Stacks:** Python, Heidi SQL, SCCM, NEAR (Navient Enterprise Application Repository).

TEACHING EXPERIENCE

Instructor – MCCS 1137, Intro to R for Data Science

Fall 2025, Fall 2026

Messina College, Boston College | Brookline, MA

- Developed and delivered curriculum for an introductory course for R programming in data analysis, integrating active learning and real-world datasets.

- Covered R setup, programming, reading data, using packages, writing scripts, creating R markdown documents, and foundational data analysis, manipulation, and visualization.
- Used real-world datasets and applications to deepen learning and engagement.
- Designed assignments, group projects, and assessments to reinforce key learning outcomes.

Teaching Assistant

Aug 2018 – Dec 2022

Purdue University | Indianapolis, IN

- CSCI 44300, Database System (Undergraduate level) Fall 2022
- CSCI54900, Intelligent Systems (Graduate level, Peer assistant) Fall 2019, Fall 2021
- CSCI 48900, Data Science (Undergraduate level) Spring 2019
- CSCI 36300, Principles of Software Design (Undergraduate level) Fall 2019
- CSCI 36200, Data Structures (Undergraduate level)) Fall 2018
- Assisted instructors with grading, supporting weekly lectures, and hosting office hours to provide guidance and mentoring for students as needed.
- Fostered an inclusive and respectful learning environment that supported inter-group relations and built cohesion among diverse undergraduate and graduate students.

TECHNICAL SKILLS

Programming Languages: Python, R, SQL, JSL, SAS, d3.js, C++

Databases: MS SQL Server, Oracle, MySQL

Tools: Jupyter, Spyder, JMP Pro, SSMS, Heidi SQL, Tableau, Weka, Erwin data modeler, R Studio, Git, AWS, Gephi, R Shiny

ML Libraries: nltk, spaCy, gensim, networkx, pytorch, scikit-learn, tensorflow, keras, matplotlib, Stanford CoreNLP, sciPy, plotly, streamlit

PUBLICATIONS

- **Ritika Pandey**, Jeremy Carter, James Hill, George Mohler, "**Rewiring police officer training networks to reduce forecasted use of force**", 2023. ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD '23). Association for Computing Machinery, New York, NY, USA. <https://doi.org/10.1145/3580305.3599899>
- **Ritika Pandey**, P. Jeffrey Brantingham, Craig D. Uchida and George Mohler, "**Building knowledge graphs of homicide investigation chronologies**", 2020. International Conference on Data Mining Workshops (ICDMW), Sorrento, Italy, 2020. <https://doi.org/10.1109/ICDMW51313.2020.00115>
- John Lu, Sumati Sridhar, **Ritika Pandey**, Mohammad Al Hasan, and George Mohler, "**Investigate Transitions into Drug Addiction through Text Mining of Reddit Data**", 2019. In Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD '19). Association for Computing Machinery, New York, NY, USA. <https://doi.org/10.1145/3292500.3330737>

- John Lu, Sumati Sridhar, **Ritika Pandey**, Mohammad Al Hasan, and George Mohler, "**Redditors in recovery: text mining reddit to investigate transitions into drug addiction**", 2018 IEEE International Conference on Big Data. <https://doi.org/10.48550/arXiv.1903.04081> .
- **Ritika Pandey**, George Mohler, "**Evaluation of crime topic models: topic coherence vs spatial crime concentration**", 2018. IEEE International Conference on Intelligence and Security Informatics (ISI), Miami, FL, USA, 2018. <https://doi.org/10.1109/ISI.2018.8587384>

OTHER INVOLVEMENT

- NeurIPS (reviewer 2025, 2026),
- Journal of Quantitative Criminology (reviewer),
- Police Quarterly (reviewer),
- Society of Women Engineers (professional member),
- Women in Computer Science (executive committee member, past),
- Second Helpings (volunteer, past)