

Prabin Bhandari

✉ prb977@gmail.com | 🌐 prabin525.github.io | 🐙 github.com/prabin525 | 🎓 Google Scholar

BIO Ph.D. candidate in Computer Science focused on large language models and agentic AI, with research on developing, training, and evaluating LLM-based generative agents for real-world applications.

EDUCATION **George Mason University** Fairfax, Virginia, USA

Ph.D. in Computer Science **August 2021 – Present (Expected: December 2026)**

Dissertation: Scalable Mini-World: LLM-Based Agentic System for Scalable Urban Mobility Modeling

Advisors: Antonios Anastasopoulos and Dieter Pfoser

M.S. in Computer Science (Machine Learning Concentration) **2024**

Pulchowk Campus, Tribhuvan University Lalitpur, Nepal

Bachelor's in Computer Engineering **2013 – 2017**

RESEARCH EXPERIENCE **Research Assistant** **2023 – Present**
George Mason University Fairfax, Virginia, USA

Generative Agents and Agent Training — UrbanLLMind

- Developed a scalable LLM-powered generative agent-based model (GABM) for urban mobility simulation, integrating agent planning, sequential decision-making, persistent memory, and reflection within city environments constructed from geographic and demographic data.
- Adapted open-weight LLMs through supervised fine-tuning (SFT) on travel-survey data and integrated them into UrbanLLMind; evaluated simulated behavior against National Household Travel Survey (NHTS) data and assessed responses to changing environmental conditions.
- Demonstrated scalability to 10,000 agents powered by an open-weight 120B-parameter model on local GPU infrastructure.
- Ongoing: Extending UrbanLLMind to support household and community coordination, alongside further SFT and reinforcement learning to improve agent behavior.

LLM Adaptation and Evaluation — Mobility Synthesis

- Developed methods for generating synthetic travel diaries using prompted and fine-tuned LLMs, evaluating their effectiveness across U.S. metropolitan areas.
- Designed multi-level evaluations of activity sequences, trip transitions, and travel times; demonstrated that fine-tuning open-weight models on survey data produces outputs that more closely match observed mobility patterns.

Spatial Knowledge and Reasoning in LLMs

- Designed probing experiments using coordinate prediction, spatial prepositions, and geographic reconstruction to characterize the spatial knowledge, awareness, and reasoning capabilities of pre-trained LLMs.

Research Intern **May 2024 – May 2025**
Oak Ridge National Laboratory Oak Ridge, TN & Remote

LLM-Based Information Extraction and Geospatial Grounding

- Developed an LLM-based pipeline to extract structured epidemiological events—including disease outbreaks, case counts, dates, and locations—from scientific literature and reports.
- Integrated GADM administrative data with LLM-based location disambiguation to geotag extracted events, providing supporting text and location-resolution reasoning to streamline human validation.

Bhandari, P., Reia, S. M., Pfoser, D., & Anastasopoulos, A. (2026). UrbanLLMind: Scalable LLM-Powered Urban Mobility Simulation with Open-Weight Models. In *Proceedings of the Third Conference on Language Modeling (COLM 2026)*. openreview.net/pdf?id=jaK0A4Dzf2 [To appear]

Bhandari, P., Anastasopoulos, A., & Pfoser, D. (2026). Behaviorally Realistic Urban Mobility Synthesis via Fine-Tuned Large Language Models. *ACM Transactions on Spatial Algorithms and Systems (TSAS)*, 12(4), Article 19, 33 pages. [doi:10.1145/3816246](https://doi.org/10.1145/3816246)

Bhandari, P., Anastasopoulos, A., & Pfoser, D. (2024). Urban Mobility Assessment Using LLMs. In *Proceedings of the 32nd ACM International Conference on Advances in Geographic Information Systems (SIGSPATIAL '24)*, 67–79. [doi:10.1145/3678717.3691221](https://doi.org/10.1145/3678717.3691221) [Best Paper Award]

Harrod, K. K.*, **Bhandari, P.***, & Anastasopoulos, A. (2024). From Text to Maps: LLM-Driven Extraction and Geotagging of Epidemiological Data. In *Proceedings of the Third Workshop on NLP for Positive Impact (NLP4PI @ EMNLP 2024)*, 258–270. aclanthology.org/2024.nlp4pi-1.24 [Outstanding Paper Award] (*Equal contribution)

Bhandari, P., Anastasopoulos, A., & Pfoser, D. (2023). Are Large Language Models Geospatially Knowledgeable? In *Proceedings of the 31st ACM International Conference on Advances in Geographic Information Systems (SIGSPATIAL '23)*. [doi:10.1145/3589132.3625625](https://doi.org/10.1145/3589132.3625625)

Bhandari, P., & Brennan, H. (2023). Trustworthiness of Children Stories Generated by Large Language Models. In *Proceedings of the 16th International Natural Language Generation Conference (INLG '23)*, 352–361. [doi:10.18653/v1/2023.inlg-main.24](https://doi.org/10.18653/v1/2023.inlg-main.24)

Preprints

Bhandari, P. (2024). A Survey on Prompting Techniques in LLMs. [arXiv:2312.03740](https://arxiv.org/abs/2312.03740)

Bhandari, P., & Paudel, A. (2024). Using Contextual Information for Sentence-level Morpheme Segmentation. [arXiv:2403.15436](https://arxiv.org/abs/2403.15436)

Adhikari, B., & **Bhandari, P.** (2023). Estimation of Vehicular Velocity based on Non-Intrusive stereo camera. [arXiv:2304.05298](https://arxiv.org/abs/2304.05298)

HONORS & AWARDS

Outstanding PhD Student Award — GMU CS Department	2025
Distinguished Academic Achievement Award — GMU CS Department	2025
Best Paper Award — ACM SIGSPATIAL	2024
Outstanding Paper Award — NLP4PI @ EMNLP	2024
SIGSPATIAL NSF Travel Award	2024
GMU Graduate Student Travel Fund	2023, 2024
Civil Employee Children's Scholarship for undergraduate education	2014

INDUSTRY & ENTREPRENEURIAL EXPERIENCE	Senior Software Engineer Assurance IQ, LLC Developed full-stack applications and scalable backend microservices for insurance policy matching, automated customer onboarding, and integrations with insurance carriers.	2020 – 2021 Remote
	Co-founder and Software Engineer TechKunja Pvt. Ltd. - Co-founded the company and developed backend systems for client and in-house software products. - Led engineering teams and managed software development projects.	2015 – 2020 Pulchowk, Nepal
TEACHING & MENTORING	Teaching Assistant George Mason University - Supported graduate and undergraduate courses in Advanced Natural Language Processing, Natural Language Processing, Database Concepts, Introduction to Computer Programming, and Essentials of Computer Science. - Led lab sessions, held weekly office hours, and graded assignments.	2021 – 2023 Fairfax, Virginia, USA
	Course Instructor Swastik College - Taught undergraduate courses in Artificial Intelligence, Data Warehousing and Data Mining, Image Processing, Computer Graphics, and E-Commerce. - Supervised undergraduate capstone theses and semester projects.	2018 – 2021 Madhyapur Thimi, Nepal
	Co-founder and Python Instructor Line Academy Co-founded the academy, developed Python programming curricula, and trained students and professionals in software development and data fundamentals.	2018 – 2020 Pulchowk, Nepal
TECHNICAL SKILLS	LLM Training and Evaluation: Supervised fine-tuning (full fine-tuning, LoRA, QLoRA), reinforcement learning (PPO, GRPO), prompting, capability probing, and LLM and agent evaluation. Agent Systems: Generative agent-based modeling, agent planning, sequential decision-making, persistent memory, reflection. ML and LLM Frameworks: PyTorch, Hugging Face Transformers, NVIDIA NeMo, verl, Axolotl, vLLM, TensorFlow. Programming Languages: Python, SQL, C/C++, Java, JavaScript, Ruby, MATLAB. Scientific Computing and Simulation: NumPy, pandas, scikit-learn, Matplotlib, Repast4Py, OSMnx. Systems and Infrastructure: HPC/Slurm, Singularity, Docker, Kubernetes, Git. Databases and Search: PostgreSQL, MySQL, MongoDB, Neo4j, Elasticsearch.	
PROFESSIONAL SERVICE & LEADERSHIP	Reviewer: ACL Rolling Review (ARR); Workshop on NLP for Positive Impact (NLP4PI); Journal of the American Medical Informatics Association (JAMIA); International Journal of Geographical Information Science (IJGIS); Cities. Judge: TJHSST Science and Engineering Fair (2026). Marketing Manager: LOCUS (2017). Board Member: Sano Sansar Initiative (2015–2017).	
REFERENCES	Dr. Antonios Anastasopoulos Associate Professor, Department of Computer Science George Mason University Ph.D. Advisor antonis@gmu.edu Dr. Dieter Pfoser Professor, Department of Geography and Geoinformation Science George Mason University Ph.D. Advisor dpfoser@gmu.edu	