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Bishnu Bhusal

Education

- 2022–Present **Ph.D. in Computer Science**, *University of Missouri*, Columbia MO, USA.
GPA – 4.0 / 4.0
Advisor: Prof. Rohit Chadha
- 2022–2024 **M.Sc. in Computer Science**, *University of Missouri*, Columbia MO, USA.
GPA – 4.0 / 4.0
Minor: Statistics
- 2013–2017 **B.Eng. in Computer Engineering**, *Tribhuvan University*, Kathmandu, Nepal.
GPA – 3.4 / 4.0

Experience

- Jan 2022 – **Graduate Research Assistant**, *University of Missouri*, Columbia.
- Present
- Developed and implemented a PSPACE-complete algorithm for determining the differential privacy of online randomized algorithms, leading to a precise characterization of the class of differentially private DiP automata, with successful implementation and experimentation to validate its effectiveness.
 - Developed and implemented techniques for integrating real function handling capabilities into δ -decision procedures, resulting in the creation of \int dReal, a novel tool built upon dReal. This advancement enables the resolution of synthesis and verification problems concerning formulas over real numbers with integral constraints.
 - Researched Blockchain-based insurance claims processing, verifying chaincodes' integrity via linear temporal logic (LTL). Ensured secure transactions through formal modeling, simulation, and model checking, enhancing efficiency and reliability.
 - Conducted innovative cybersecurity research on ransomware defense, developed a game theoretic model using deception strategies, and demonstrated their effectiveness in protecting critical societal infrastructures.
 - Developed a novel Virtual Try-On application (VTON-IT) using Generative Adversarial Networks (GANs), incorporating semantic segmentation and image translation techniques to create photo-realistic clothing try-on experiences, addressing challenges related to body size, pose, and occlusions. Achieved high-resolution, natural-looking results with detailed textures.
- Jan 2023 – **Graduate Teaching Assistant**, *University of Missouri*, Columbia.
- Present
- Currently assisting in CS 7420 Software Security; responsible for redesigning some of seed lab exercises and grading student submissions.
 - Conducted weekly labs for CS 1050 Algorithm Design and Programming I, guiding students in C programming and responsible for lab grading.

- Nov 2020 – **Software Engineer**, *Geoedge*, NYC, New York.
- Jan 2022
- o Built innovative and highly scalable microservices for handling 1.5 billion requests per day and managing petabytes of data in Elasticsearch.
 - o Moved existing microservices to auto-scaling using kubernetes with custom scaling metrics.
 - o Efficiently deployed and integrated software engineered by the team and updated integration/deployment scripts to improve continuous integration practices.
 - o Maintained maximum uninterrupted flow of business-critical ops. Cut downtime by 25% and lower cloud infra cost by 35%.
- Nov 2020 – **Software Engineer**, *Furitech*, Tel Aviv, Israel.
- Jan 2022
- o Excelled in rapid application development and management of technological issues for assigned projects, earning the highest customer satisfaction.
 - o Contributed software engineering expertise in product development through the software lifecycle, from requirements definition to successful deployment.
 - o Developed a comprehensive information management system for venture capital, utilizing Django (backend) and Angular (frontend) to efficiently aggregate startup data, including founder and C-level officer profiles, from sources such as LinkedIn and Y Combinator.
- Dec 2018 – **Software Engineer**, *Furitech*, Tel Aviv, Israel.
- Jan 2020
- o Developed and monitored platform for mining 70+ cryptocurrencies using micro-service architecture with nearly zero-downtime.
 - o Worked with a time-series database (InfluxDB) and created a dashboard to monitor critical metrics using Grafana.
 - o Developed a platform for auto-trading cryptocurrencies in different exchanges with sophisticated algorithm to get the best selling price.
 - o Developed an algorithm to predict the future difficulty of cryptocurrencies.

Certifications

- 2023 **AWS Associate Solutions Architect (SAA-C03)**, by AWS.
- 2023 **Graduate Certificate in Cybersecurity**, by *University of Missouri*, Columbia.
- 2020 **Deep Learning Specialization**, by *deeplearning.ai*.

Awards

- 2024 **Winner**, *GPC Interdisciplinary Case Competition*, University of Missouri, Columbia.
- 2023 **EECS Excellence Travel Grant**, *University of Missouri*, Columbia.
- 2023 **IEEE SaTML Travel Grant**, *IEEE SaTML*.
- 2022 **EECS Excellence Fellowship**, *University of Missouri*, Columbia.
- 2015 **Runner-up**, *KEC LITE Software Competition*, Kathmandu, Nepal.

Workshops and Summer Schools

- 2023 **Formal Techniques**, *SRI*, Atherton, CA.

Publications

Drafts and Preprints

Rivera C., **Bhusal, B**, Chadha, R., Sistla, A. P., and, Viswanathan, M. . Checking δ -Satisfiability of Reals with Integrals. Submitted to a Conference, 2024.

Conferences

- CCS'23 Chadha, R., Sistla, A. P., Viswanathan, M., and **Bhusal, B.** Deciding differential privacy of online algorithms with multiple variables. In Proceedings of the 2023 ACM SIGSAC Conference on Computer and Communications Security (New York, NY, USA, 2023), CCS '23, Association for Computing Machinery, p. 1761–1775.
- NOMS'24 Neupane Lal R., Bonnah E. ,**Bhusal B.**, Neupane K., Hoque Anuarul K, Calyam P.. Formal Verification for Blockchain-based Insurance Claims Processing. In Proceedings of the NOMS 2024 - 37th IEEE/IFIP Network Operations and Management Symposium

Academic Service

- 2023 **Artifact Evaluation Committee**, *The ACM Conference on Computer and Communications Security, CCS*.

Leadership and Volunteering Activities

- 2023–2024 **Secretary**, *EECS Graduate Student Association*, University of Missouri, Columbia.

References

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