KRITAGYA RAJ UPADHYAY

333 Bernard St
Denton, TX, 76201
(940)-390-8714
kritagyaupadhyay@my.unt.edu
kritagya93@gmail.com

EDUCATION

2018 - Present	**Doctor of Philosophy, Computer Science and Engineering** Department of Computer Science and Engineering University of North Texas, Denton, Texas *Advisor*: Prof. Ram Dantu, Ph.D. *Dissertation*: Paradigm Shift from Ambiguous Legal Contracts to Blockchain-based Smart Contracts
2011 - 2015	**Bachelor of Information Management** Faculty of Management College of Applied Business Tribhuvan University, Nepal

RESEARCH INTERESTS

Blockchain, Smart Contracts, Ambiguous Legal Contracts, Natural Language Processing (NLP), Machine Learning, Artificial Intelligence, Fuzzy Logic, Computer Networks and Cyber Security, Data Cooperatives, Metaverse, Consensus Mechanisms in Blockchain, Quantum Computing and Communications

RESEARCH AND TEACHING EXPERIENCE

2018 - Present	**Graduate Teaching Assistant** Department of Computer Science and Engineering, University of North Texas • Support for many undergraduate and graduate-level courses such as Intro to Computer Security, Intro to Computer Science and Programming in C++, Intro to Computer Networks, Foundations of Data Structures, Computer Forensic, Advance Network Security - Blockchain Developer Course, Cryptography, Secure Software Systems • Guidance to undergraduate and graduate students on their research projects and senior design projects

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2018 – Present	**Doctoral Researcher** Network Security Lab, University of North Texas

- Research on Ethereum-based Blockchain technologies, especially on Smart Contracts and Ambiguous Legal Contracts
- Design and implementation of Ethereum-based Blockchain decentralized applications (dApps) that were translated from various ambiguous legal contracts
- Research on Legal Contracts and Smart Contracts using Fuzzy Logic, Machine Learning and Natural Language Processing
- Study on Consensus Mechanisms, Quantum Networking and Communications
- Write proposals for grants for NSA and NSF
- Extensive programming experience including C, C++, Python, Solidity, JavaScript, as well as in Linux OS and documentation applications including Microsoft Office, LaTex, Mendeley

Summer 2021	**Graduate Student Assistant** Department of Computer Science and Engineering, University of North Texas

- Conducted administrative and technical tasks in the lab requested by the advisor
- Assisted and mentored other students in the lab

2011 – 2015	**Undergraduate Researcher** Faculty of Management College of Applied Business, Tribhuvan University

- Research on secure online store management system

PUBLICATIONS

1. **K. Upadhyay**, R. Dantu, Y. He, S. Badruddoja and A. Salau, "Auditing Metaverse Requires Multimodal Deep Learning," *2022 Fourth IEEE International Conference on Trust, Privacy and Security in Intelligent Systems and Applications (TPS-ISA)*, 2022.

2. A. Salau, R. Dantu, **K. Upadhyay**, S. Badruddoja, "Data Cooperatives for Trusted News Sharing in Social Media," *EAI BlockTEA 2022 - 2nd EAI International Conference on Blockchain Technology and Emerging Applications.*

3. S. Badruddoja, R. Dantu, Y. He, A. Salau, **K. Upadhyay**, "Scalable Smart Contracts for Linear Regression Algorithm," *EAI BlockTEA 2022 - 2nd EAI International Conference on Blockchain Technology and Emerging Applications.*

4. A. Salau, R. Dantu, K. Morozov, S. Badruddoja and **K. Upadhyay**, "Making Blockchain Validators Honest," *2022 Fourth International Conference on Blockchain Computing and Applications (BCCA)*, 2022, pp. 267-273, doi: 10.1109/BCCA55292.2022.9921952.

5. S. Badruddoja, R. Dantu, Y. He, M. Thompson, A. Salau and **K. Upadhyay**, "Trusted AI with Blockchain to Empower Metaverse," *2022 Fourth International Conference on Blockchain Computing and Applications (BCCA)*, 2022, pp. 237-244, doi: 10.1109/BCCA55292.2022.9922027.

6. S. Badruddoja, R. Dantu, Y. He, M. Thompson, A. Salau and **K. Upadhyay**, "Smarter Contracts to Predict using Deep-Learning Algorithms," *2022 Fourth International Conference on Blockchain Computing and Applications (BCCA),* 2022, pp. 280-288, doi: 10.1109/BCCA55292.2022.9922240.

7. S. Badruddoja, R. Dantu, Y. He, M. Thompson, A. Salau and **K. Upadhyay**, "Making Smart Contracts Predict and Scale," *2022 Fourth International Conference on Blockchain Computing and Applications (BCCA)*, 2022, pp. 127-134, doi: 10.1109/BCCA55292.2022.9922480.

8. Salau, A., Dantu, R., Morozov, K., **Upadhyay, K.**, & Badruddoja, S. (2022). Multi-Tier Reputation for Data Cooperatives. In *The 3rd International Conference on Mathematical Research for Blockchain Economy*.

9. Salau, A.; Dantu, R.; Morozov, K.; **Upadhyay, K.** and Badruddoja, S. (2022). Towards a Threat Model and Security Analysis for Data Cooperatives. In *Proceedings of the 19th International Conference on Security and Cryptography - SECRYPT,* ISBN 978-989-758-590-6; ISSN 2184-7711, pages 707-713. DOI: 10.5220/0011328700003283.

10. **K. Upadhyay**, R. Dantu, Y. He, A. Salau and S. Badruddoja, "Paradigm Shift from Paper Contracts to Smart Contracts," *2021 Third IEEE International Conference on Trust, Privacy and Security in Intelligent Systems and Applications (TPS-ISA),* 2021, pp. 261-268, doi: 10.1109/TPSISA52974.2021.00029.

11. **K. Upadhyay**, R. Dantu, Y. He, S. Badruddoja and A. Salau, "Can't Understand SLAs? Use the Smart Contract," *2021 Third IEEE International Conference on Trust, Privacy and Security in Intelligent Systems and Applications (TPS-ISA)*, 2021, pp. 129-136, doi: 10.1109/TPSISA52974.2021.00015.

12. **K. Upadhyay**, R. Dantu, Y. He, A. Salau and S. Badruddoja, "Make Consumers Happy by Defuzzifying the Service Level Agreements," *2021 Third IEEE International Conference on Trust, Privacy and Security in Intelligent Systems and Applications (TPS-ISA)*, 2021, pp. 98-105, doi: 10.1109/TPSISA52974.2021.00011.

13. S. Badruddoja, R. Dantu, Y. He, **K. Upadhayay** and M. Thompson, "Making Smart Contracts Smarter," *2021 IEEE International Conference on Blockchain and Cryptocurrency (ICBC)*, 2021, pp. 1-3, doi: 10.1109/ICBC51069.2021.9461148.

14. A. Salau, R. Dantu and **K. Upadhyay**, "Data Cooperatives for Neighborhood Watch," *2021*

IEEE International Conference on Blockchain and Cryptocurrency (ICBC), 2021, pp. 1-9, doi: 10.1109/ICBC51069.2021.9461056.

15. **K. Upadhyay**, R. Dantu, Z. Zaccagni and S. Badruddoja, "Is Your Legal Contract Ambiguous? Convert to a Smart Legal Contract," *2020 IEEE International Conference on Blockchain (Blockchain)*, 2020, pp. 273-280, doi: 10.1109/Blockchain50366.2020.00041.

16. S. Badruddoja, R. Dantu, L. Widick, Z. Zaccagni and **K. Upadhyay**, "Integrating DOTS With Blockchain Can Secure Massive IoT Sensors," *2020 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, 2020, pp. 937-946, doi: 10.1109/IPDPSW50202.2020.00156.

PROFESSIONAL EXPERIENCE

Summer 2022	**Internship, CertiK**
	• Audited the smart contracts of various clients to identify the errors and risks, remediate the vulnerabilities and verify the correctness of the contract code
	• Immediate analysis of real-world blockchain and web3 exploits/incidents and evaluations provided for each incident
2016 – 2017	**A Plus Computer Suppliers**
	• Monitored and maintained computer hardware, network connections and occurrence of bugs, checked and reported hardware and software malfunctions, and sorted data into peripheral devices
2015 – 2016	**Subisu Cablenet Limited**
	• Provided technical and network problem resolution to end-users by troubleshooting and repairing faults, resolving network issues, and installing and configuring hardware and software
Summer 2015	**Internship, Thamel.Com**
	• Designed, developed, tested and maintained the e-commerce website including catalog management and product information check and update

HONORS /AWARDS

2022	**Best Research Paper Award**
	Awarded at 4th Int'l Conference on Blockchain Computing & Applications

| 2022 | **Outstanding Teaching Assistant Award Nomination** |
| | Nominated by Dept. of Computer Science and Eng., University of North Texas |

| 2021 | **NSA Innovation Award** |
| | Awarded by the Center for Academic Excellence and Research (CAE-R) |

| 2020 – | **Conference Registration Grant** |
| Present | Awarded by College of Engineering, University North Texas |

| 2018 – | **Tuition Benefit Program Award** |
| Present | Awarded by University of North Texas |

| 2018 – | **College of Engineering Department Award** |
| Present | Awarded by College of Engineering, University North Texas |

PRESENTATIONS

Dec 2022	Auditing Metaverse Requires Multimodal Deep Learning. The 4th IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications.
Nov 2022	Data Cooperatives for Trusted News Sharing in Social Media. EAI BlockTEA 2022 - 2nd EAI International Conference on Blockchain Technology and Emerging Applications, Copenhagen, Denmark.
Dec 2021	Paradigm Shift from Paper Contracts to Smart Contracts. The 3rd IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications, Atlanta, GA, USA.
Dec 2021	Can't Understand SLAs? Use the Smart Contract. The 3rd IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications, Atlanta, GA, USA.
Dec 2021	Make Consumers Happy by Defuzzifying the Service Level Agreements. The 3rd IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications, Atlanta, GA, USA.
Nov 2020	Is Your Legal Contract Ambiguous? Convert to a Smart Legal Contract. The 3rd IEEE International Conference on Blockchain (Blockchain 2020), Rhodes Island, Greece.

PROFESSIONAL AFFILIATIONS AND SERVICES

Ad-hoc Reviewer
a. 2021 IEEE Information Theory Workshop (ITW), Kanazawa
b. 26th Australasian Conference on Information Security and Privacy

c. Information Processing & Management Journal, Elsevier

Professional Organization Member
   a. IEEE Student