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Ramesh Paudel

Education

2016-Present **Ph.D. in Computer Science**, Tennessee Tech University, Cookeville, TN,
Dissertation: Fast and Efficient Anomaly Detection in Non-Stationary Graph Stream.
Advisor: Dr. William Eberle

2012–2014 **Masters in Computer Science**, Tennessee Tech University, Cookeville, TN.
Specialized in Data Mining and Machine Learning

2007–2010 **Bachelor in Information Technology**, Purbanchal University, Nepal.

Research Interests

- o Machine Learning
- o Artificial Intelligence
- o Cyber Security
- o Social Network Analysis
- o Anomaly/Fraud Detection
- o Graph Mining
- o Concept Drift Detection
- o Time-series Analysis

Research Experiences

2016–Present **Research Assistant**, Tennessee Tech University, Cookeville, TN.
Actively working on research related to anomaly/fraud detection in smart homes IoT devices, healthcare, and social network, concept drift detection, and graph streams classification.

summer-2019 **Graduate Research Mentor**, College of Engineering-TTU, Cookeville, TN.
Supervised "Detecting DoS Attack in Smart Home IoT Devices" project funded by NSF under Research Experience for Undergraduates (REU) - Cybersecurity program

summer-2018 **Graduate Research Mentor**, College of Engineering-TTU, Cookeville, TN.
Supervised "Detecting the Onset of Network Layer DoS Attack" project funded by NSF under Research Experience for Undergraduates (REU) - Cybersecurity program.

Teaching Experiences

2018 **Instructor**, Tennessee Tech University, Cookeville, TN.
Course taught: **Discrete Mathematics**

2016 **Lab Instructor**, Tennessee Tech University, Cookeville, TN.
Course conducted: **Data Structure and Algorithms**

2012–2014 **Teaching Assistant**, Tennessee Tech University, Cookeville, TN.
Assisted Courses: Data structure/algorithm, Computer Programming

Industry Experiences

2014–2016 **Data Analyst/Software Developer**, Bespoke House Inc., Boston.

- Analyze web, social media and search data using SQL and Google Analytic.
- Analyze booking and buying pattern for hotels and suggest marketing campaign.
- Persona classification using CRM data to develop an effective marketing campaign for lead generation
- Assemble, monitor and develop search engine optimization campaigns.
- Develop real estate and boutique hotel websites using Asp.Net platform.

2012 **IT support**, College of Engineering, TTU, Cookeville, TN.

2010–2012 **Software Developer**, Midas Technologies, Kathmandu, Nepal.

- Develop report interface, laboratory, medical record & OT module of Hospital Management Info. System.
- Verify, process, and analyze the HMIS data.
- Provide report/feedback to government agencies/hospitals on coverage and quality of health services.

Publications

2020 **R Paudel** and W Eberle, "An Approach For Concept Drift Detection in a Graph Stream Using Discriminative Subgraphs", *ACM Transaction on Knowledge Discovery from Data. (Accepted).*

2019 **R Paudel**, T Muncy, and W Eberle, "Detecting DoS Attack in Smart Home IoT Devices Using a Graph-Based Approach", *In Proceedings of the 2019 International Workshop on IoT Big Data and Blockchain.*

Ramesh Paudel, Prajjwal Kandel, and William Eberle, "Detecting Spam Tweets in Trending Topics using Graph-Based Approach", *In Proceedings of the Future Technology Conference - 2019.*

Ramesh Paudel, Peter Harlan, William Eberle, "Detecting the Onset of a Network Layer DoS Attack with a Graph-Based Approach", *In Proceedings of the FLAIRS Conference.*

2018 **Ramesh Paudel**, William Eberle, Lawrence Holder, "Anomaly Detection of Elderly Patient Activities in Smart Homes using a Graph-Based Approach", *In Proceedings of 2018 International Conference on Data Science.*

Ramesh Paudel, Kimberlyn Dunn, William Eberle, Danielle Chaung, "Cognitive Health Prediction on the Elderly Using Sensor Data in Smart Homes", *In Proceedings of the Thirty-First International FLAIRS Conference (FLAIRS-31).*

2017 **Ramesh Paudel**, William Eberle, Doug Talbert, "Detection of Anomalous Activity in Diabetic Patients Using Graph-Based Approach", *In Proceedings of the Thirtieth International FLAIRS Conference (FLAIRS-30).*

Poster **R Paudel**, "SNAPSKETCH: Network Representation Approach for Anomaly Detection in Dynamic Network", *In RSA Security Conference, 2020.*

Ramesh Paudel, William Eberle, "An Approach For Concept Drift Detection in a Graph Stream Using a Discriminative Subgraph", *In Proceedings of Student Research and Creative Inquiry, 2019.*

Ramesh Paudel, James Park, William Eberle , "Mining Heterogeneous Graph for Patterns and Anomalies", *In Proceedings of Student Research & Creative Inquiry, 2018.*

Ramesh Paudel and William Eberle , "Mining Twitter Network for Interaction Patterns", *In Proceedings of Student Research and Creative Inquiry, 2014.*

Work in Progress **Ramesh Paudel**, William Eberle, "Graph Representation using Discriminative Shingle-based Sketching", *Target: IEEE Transaction on Knowledge and Data Engineering.*

Lauren Good, **Ramesh Paudel**, Gerald Gannod, and William Eberle, "Visualising Network Anomalies using Graph-based Technique".

Technical skills

Language Python, R, SQL, Asp.Net, C#, Java, C++, Php, LaTeX, Javascript, HTML, CSS

Tools Tensorflow, Keras, Scikit-learn, Numpy, Scipy, Pandas, Matplotlib, Tableau, Weka, Orange, Git/GitHub, Google Analytic, Rabbitmq, Jupyter

Database MySql, Oracle, SQL Server

Others Strong knowledge of Object Oriented Programming, Data Structures/Algorithms,

Presentations

Research Presentation, *on "Detecting DoS Attack in Smart Home IoT Devices using a Graph-based approach"*, at the 2019 International Workshop on IoT Big Data and Blockchain, Los Angeles, CA.

Research Presentation, *on "Detecting DoS Attack in Smart Home IoT Devices"*, at the Graduate Student Seminar, Tennessee Tech University-2019.

Research Paper Presentation, *The Future Technology Conference*, CA, 2019.

Research Paper Presentation, *The Thirty Second International FLAIRS Conference*, FL, 2019.

Research Poster Presentation, *The 14th Annual Research and Creative Inquiry Day*, Tennessee Tech University, 2019.

Research Paper Presentation, *International Conference on Data Science*, Las Vegas, NV, 2018.

Research Poster Presentation, *The 13th Annual Research and Creative Inquiry Day*, Tennessee Tech University, 2018.

Research Presentation, *on "Anomalous Activity Detection in Smart Homes using a Graph-Based Approach"*, at the Graduate Student Seminar, 2018.

Research Paper Presentation, *The Thirtieth International FLAIRS Conference*, FL, 2017.

Conferences and Workshops

2019 IEEE International Conference on Big Data, Los Angeles, CA 2019.

The Future Technologies Conference (FTC 2019), San Francisco, CA 2019.

The 32nd International FLAIRS Conference, Sarasota, FL 2019.

The International Conference on Data Science (ICDATA), Las Vegas, NV 2018.

The 30th International FLAIRS Conference, Sarasota, FL 2017.

Awards, Honors, and Grants

RSAC Security Scholar 2020, by RSA Security Conference, 2020.

Research Assistant Fellowship, by Tennessee Tech University - College of Engineering (COE) for achieving Carnegie classification, *awarded for being one of the top students from COE, 2016-Present.

Researcher (Cybersecurity), *NSF Grant Number 1852126*, under the PI/co-PI Dr. Syed Rafay Hasan and Dr. Mohamed Mahmoud, 2019.

Best Research Poster, *An Approach for Concept Drift Detection in a Graph Stream using Discriminative Subgraph*, The 14th Annual Research and Creative Inquiry Day, 2019.

Researcher (Cybersecurity), *NSF Grant Number 1560434*, under the PI/co-PI Dr. Syed Rafay Hasan and Dr. Mohamed Mahmoud, 2018.

Projects

2019 **Predicting Highest Growth Customer**.
Use AI tools to segment customer in ways that can be useful for sales, product, and other teams and identify and predict high growth customers

Prediction of Job Apply Rate for User Visiting Glassdoor.
Predict the job apply rate for user visiting Glassdoor and performing a job search using Logistic Regression, ANN, Naive Bayes, Decision Tree, Random Forest, KNN, and Bagging.

2017 **Anomaly Detection in Opioid Prescription**.
Uses graph-based analysis of Medicare Part D prescriber summary data to look for anomalies and potential fraud scenarios in the relationships and transactions carried by prescriber.

Analysis of Pattern Learning and Anomaly Detection on Streams.

2014 **LINKCUBE: A Tool for Anomaly Detection in Social Network using GBAD**.

Other Experiences

Paper Reviewer, IEEE Journal of Biomedical and Health Informatics, 2019.

Graduate Mentor, Advising Master Student in a Project Work "Visualising Network Anomalies using Graph-based Technique", 2019.

Paper Reviewer, Springer Journal on Social Network Analysis and Mining (SNAM), 2019.

Paper Reviewer, SIAM International Conference on Data Mining (SDM), 2017.

Community Services

Volunteer, ACM programming contest, Fall 2012.

Volunteer, ACM programming contest, Fall 2013.

References

Dr. William Eberle, Professor,
Department of Computer Science,
Tennessee Tech University.
1 William L Jones Dr, Cookeville, TN 38505
Phone: (931) 372-3278 **Email:** weberle@tntech.edu

Dr. Gerald Gannod, Professor,
Department of Computer Science,
Tennessee Tech University.
1 William L Jones Dr, Cookeville, TN 38505
Phone: (931) 372-3691 **Email:** jgannod@tntech.edu

Dr. Doug Talbert, Professor,
Department of Computer Science,
Tennessee Tech University.
1 William L Jones Dr, Cookeville, TN 38505
Phone: (931) 372-6178 **Email:** dtalbert@tntech.edu