

Priyanka Nath

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Education

Stony Brook University (SUNY Stony Brook) – New York, USA August, 2019 - Present
Master of Science (Computer Science)

KIIT University (formerly Kalinga Institute Of Industrial Technology) – Bhubaneswar, India July, 2019 - 8.79 / 10.0
Bachelor of Technology, Information Technology

South Point High School – Kolkata, India
Senior School Certification Examination, (Grade 12) Stream: Science with Computer Science as additional subject
Secondary Examination, (Grade 10)

Publications

Kumari, Divya, Priyanka Nath, Sumran Kilam, and Aleena Swetapadma. **"Volatile Substance Abuse: A Nearest Neighbor Based Analysis."** In International Conference on Innovative Technologies in Engineering (ICITE), 2018.

Kumari, Divya, Sumran Kilam, Priyanka Nath, and Aleena Swetapadma. **"Prediction of alcohol abused individuals using artificial neural network."** International Journal of Information Technology 10, no. 2 (2018): 233-237.

Nath, Priyanka, Sumran Kilam, and Aleena Swetapadma. **"A machine learning approach to predict volatile substance abuse for drug risk analysis."** In Research in Computational Intelligence and Communication Networks (ICRCICN), 2017 Third International Conference on, pp. 255-258. IEEE, 2017.

Experience

Amazon Inc. – Bengaluru, India March, 2019 - August, 2019
Software Development Engineer Intern, Amazon Elasticsearch Service, Amazon Web Services.

Indian Statistical Institute – Kolkata, India May, 2018 - July, 2018
Advisor - Prof. Bimal Kumar Roy
Research Intern at R. C. Bose Centre for Cryptology and Security, Indian Statistical Institute.

Indian Statistical Institute – Kolkata, India May, 2017 - July, 2017
Advisor - Prof. Ansuman Banerjee
Research Intern under the Summer Internship Program in Cryptology 2017, R. C. Bose Centre for Cryptology and Security, Indian Statistical Institute (funded by Microsoft Research India).

Projects

Generation of API-Level Metrics for Amazon Elasticsearch Service - Amazon.com, Inc. March, 2019 - August 2019
- Investigated existing metrics and determined what new metrics should be generated. Carried out a comparative study in support of the proposed metrics, weighing scalability, cost and impact on performance.
- Implemented code to generate 19 new API-level metrics for every version of Amazon Elasticsearch Service. These will be used for the diagnosis and analysis of clusters and thus improve customer experience.

Drug Risk Analysis

- Applied supervised learning using Artificial Neural Networks(ANN) to classify an individual as a user or non-user of VSA and alcohol, based on a five-factor personality model. Predicted alcohol users with accuracy of 98.7% and VSA users with accuracy of 81%.
- Experimented with the number of neurons and hidden layers to predict the last time of use of VSA users with 71.9% accuracy and alcohol users with a 49.1% accuracy.
- Increased the accuracy of time of VSA drug use prediction to 96.4% by implementing k-Nearest neighbours classification.

Principal Component Analysis using GPUs

- Implemented dimensionality reduction by applying PCA on Fischer's Iris dataset using C.
- Optimized the compute-intensive process by parallelizing it in CUDA-C by using GPUs.
- Applied k-means clustering using scikit to verify that the reduction in the number of features did not

compromise the information stored in the dataset.

Bias Verification Of Rivest Cipher (RC-4) Keystream - Indian Statistical Institute

May, 2018 - July, 2018

- Implemented a RC-4 cipher in Python and proved that the second byte of the keystream generated by the pseudorandom generator is biased towards zero with a probability, which is twice the expected value.
- Created a sample dataset of 10,000,000 cipher texts using randomly generated 32 bit keys and computed the probability distribution of each byte.
- Verified the bias in the keystream by doing a graph analysis. Plotted the data to verify the bias in the rest of the keystream as per the works of Sengupta et al.

Vulnerability Analysis of Linux System Calls – Indian Statistical Institute

May, 2017 - July, 2017

- Developed an OS system call pattern matching & analysis application for Linux to detect software vulnerabilities.
- Using inputs generated by an automated fuzzer, American Fuzzy Lop (AFL), to detect malicious binaries.
- Summer internship project, funded by the Defence Research and Development Organisation (DRDO), Government of India.

Artificial Neural Networks Implementation On The Game "Snake!"

- Developed a popular video arcade game "Snake!" using the PyGame library.
- Extracted features by generating random moves and recording their results in the game, whether they were favourable or not.
- Trained two models Artificial Neural Network through supervised learning to predict moves for optimal scoring and survival of the snake.

Naive Bayes Classifier

- Implemented a Naive Bayes Classifier from scratch for handwritten digits using Python.
- Tested classifier on the MNIST handwritten digit dataset to have an accuracy of 64.3%.

SpaceTurtle: An Introduction to Turtle Programming

- Designed a teaching kit comprising simple interactive games to introduce kids to programming and encourage them to solve problems through logical thinking.
- Won second prize in the Mozilla Hello Web hackathon, sponsored by Rotary International in association with the Mozilla Learning initiative.

Technical Skills

Programming – Coded mainly in **C, Python**. Proficient in coding with C++ and Java.

Web – HTML, CSS, JavaScript.

OS – Linux, Windows.

Machine Learning Tools – scikit, Matlab, R.

Development Tools – Android Studio, Android SDK, SQL (MySQL, Oracle), Latex.

Honors & Achievements

- Secured 4th position among 11,000 participants in the 4th CSI National Programming Contest 2017 organised by the Computer Society Of India.
- Won 2nd place in HelloWeb Hackathon 2016 hosted by the MozillaBBSR Club by designing a teaching kit to introduce kids to programming.
- Secured a perfect score (100%) in Mathematics in statewide Secondary Examination, 2013 among 1,020,000 students.
- Awarded Chitroprobha Upadhi Certification by Bengal Music College, Kolkata, India in 2012 on completing a 6-year course on Painting.
- Selected as one of 20 student judges from MP Birla group of schools for the cultural committee MP Birla Puja Utkarsh Samman 2014.