Priyanka Nath

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Education

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

KIIT University *(formerly Kalinga Institute Of Industrial Technology)* – Bhubaneshwar, 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.