# Priyanka Nath

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## Education

**KIIT University** *(formerly Kalinga Institute Of Industrial Technology)* – Bhubaneshwar, India *July, 2015 - Present*
*Bachelor of Technology, Information Technology* *Current GPA: 8.75 / 10.0*

**South Point High School –** Kolkata, India

All India Senior School Certificate Examination, CBSE (Grade 12) *June, 2015*
June, 2015 - 76.2% *Stream: Science with Computer Science as additional subject*

Secondary Examination, WBBSE (Grade 10) *May, 2013*

May, 2013 - 87.42%

## Publications

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

Divya Kumari, Sumran Kilam, *Priyanka Nath*, Aleena Swetapadma, **'Prediction of alcohol abused individuals using artificial neural network'**. 2018, *14th International Conference on Distributed Computing and Internet Technology (ICDCIT 2018)*. Published by Springer.

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

## Experience

**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

**Bias Verification Of Riverst Cipher - 4 Keystream -** Indian Statistical Institute *May, 2018 - July, 2018*
- Created a sample set of 10,000,000 cipher texts using randomly generated keys of 128 bit
- Calculated the probability of each byte in the cipher text to be a certain number from 0 to 255
- Plotted the data to verify that the RC-4 keystream is biased

**Artificial Neural Networks Implementation On The Game 'Snake!'**
- Created the game Snake from scratch in Python
- Extracted features by generating random moves
- Used the extracted features to classify if a move is valid or invalid using Artificial Neural Networks

**Linux System Call Analysis –** 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!'**
- Created the game Snake from scratch in Python
- Extracted features by generating random moves
- Used the extracted features to classify if a move is valid or invalid using Artificial Neural Networks

**Volatile Substance Abuse (VSA) Drug Risk Analysis**
- Built an Artificial Neural Networks model using Lavenberg Marquardt algorithm in Matlab to predict VSA use of individuals based on their five factor personality model, demography, etc.

**Principal Component Analysis using GPUs**
- Implemented dimensionality reduction by applying PCA on Fischer's Iris dataset using CUDA-C.

**Bookmarkz: A Social Bookmarking App**
- Developed a social bookmarking app using Django web framework where a user can create an account, share bookmarks, vote on shared bookmarks, etc.

**Vigenère Decoder and Rivest Cipher Implementations**
- Built a Vigenère Cipher Decoder which predicts 5 probable keywords given the encrypted ciphertext.
- Implemented a Rivest Cipher 4 (RC4) in Python and showed that the keystream generated by the RC4 is biased is varying degrees towards certain sequences.

**Naive Bayes Classifier**
- Implemented a Naive Bayes Classifier from scratch for handwritten digits from MNIST digit dataset.

**SpaceTurtle: An Introduction to Turtle Programming**
- Designed a teaching kit for a Mozilla Hackathon, using Python's turtle library, to introduce kids to programming and encourage them to solve problems through logical thinking.

**MysticSquare: An Android Game**
- Made a basic Mystic-Square (also known as 15 puzzle) game for Android using Android Studio.

## Technical Skills

**Programming –** Coded mainly in **C, Python.** Proficient in coding with C++ and Java.
**Web –** HTML, CSS, Javascript. **OS –** Linux, Windows.
**Developement Tools –** Android Studio, Android SDK, SQL (MySQL, Oracle), scikit, Matlab, Latex.

## Relevant Courses Taken

Linear Algebra, Data Structures & Algorithms, Object Oriented Programming, Probability & Statistics, Discrete Mathematics, Computer Networking, Operating Systems, Database Management Systems.
**MOOCs –** Machine Learning (by Andrew Ng), Cryptography I (by Dan Boneh).

## Honors & Achievements

- Secured 4$^{th}$ position among 11,000 participants in the 4th CSI National Programming Contest 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 the highest grade "O" in Object Oriented Programming, Web Technology and Computer Networks as part of my B.Tech curriculum.
- Secured a perfect score (100%) in Mathematics in state-wide 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.