

# PEEYUSH AGARWAL

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## ACADEMIC QUALIFICATIONS

Year	Degree	Institute	CPI
2016*	B.Tech.	Indian Institute of Technology Kanpur	9.3/10
2012	AISSCE (CBSE XII)	Saint Xavier's Sr. Sec. School, Jaipur	91.0%
2010	AISSE (CBSE X)	Saint Xavier's Sr. Sec. School, Jaipur	10/10

\*Expected Year of Graduation

## SCHOLASTIC ACHIEVEMENTS

- Secured All India Rank 171 (top 0.04%) among more than 500,000 students in IIT-JEE 2012
- Won the Xerox Research Innovation Challenge 2015 with more than 350 participating teams from all over India
- Received Academic Excellence Award for outstanding performance in academics at IIT Kanpur
- Selected among top 10 teams in Ericsson Innovation Award 2014-15 from all over India
- Awarded Kishore Vaigyanik Protsahan Yojana fellowship by Government of India for exceptional aptitude and caliber
- Awarded Certificate of Merit (top 1%) by CBSE for outstanding performance in All India Secondary School Examination
- Secured 1<sup>st</sup> position in state level and 8<sup>th</sup> position in national level UCMAS Abacus and Mental Arithmetic Competition

## WORK EXPERIENCE

**Intern** **Xerox Research Centre India** **Dec 2015 – Jan 2016**

- Worked on predicting emerging complications in patients admitted to hospital using real medical data
- Implemented Long Short Term Memory and boosting based models after cleaning & feature engineering raw patient data; Achieved state of the art performance

**Analyst** **American Express** **May 2015 – Jul 2015**

- Evaluated personalization capabilities of existing recommendation algorithm, identified key improvement areas and recommended enhancements to drive higher card member engagement
- Conceived, developed and validated FTRL (Follow the Regularized Leader) and Factorization Machine based models
- Designed and tested new features (historical, Gradient Boosting Tree based etc.) which led to a 2 fold increase in performance on internal benchmarks
- Devised and formulated key performance indicators for measuring personalization engine's performance based on business needs and priorities

**Software Developer** **Google Summer of Code** **May 2014 – Aug 2014**

Architected and programmed Data Analytics Log Manager, a platform for detailed user level data analytics which provides

- An API for receiving log data consisting of arbitrary key value pairs; Authentication and authorization to protect data
- Tools to filter, analyze and visualize this data
- Capability to create a parent-child relationship and add synthetic/computed data

Also wrote unit and integration tests; Used Travis CI for continuous integration and code climate for static code analysis

**Co-Founder and Technical Lead** **Falcano Technologies** **Nov 2013 – Mar 2014**

- Conceptualized and developed a customer engagement platform for retailers which provides
  - A customizable interface to collect customer feedback and contact details
  - Targeted SMS and email campaigns and analytics of collected data from the admin dashboard
- Built a low cost webcam based online attendance system as an alternative to the costly biometric system
- Acquired more than 50 paying customers from all over India

## PROJECTS

**Vastra** **Jan 2016 – Apr 2016**

*Combined course project for Probabilistic Machine Learning and Software Architecture*

- Scraped apparel data from ecommerce and fashion platforms like Flipkart, Jabong and Polyvore
- Built a SaaS platform with services for similar apparel recommendation and auto tagging
  - Modified the standard AlexNet architecture to solve the problem of multi label, multi class classification
  - Implemented various training strategies (using techniques like transfer learning, data augmentation, layer freezing etc.) for fast convergence of network during training
- Made the platform scalable using techniques like auto scaling and tools like RabbitMQ, Redis, DynamoDB etc.

## Enhancing Kubernetes Scheduler

Aug 2015 – Nov 2015

*Under Graduate Project under Prof. Sumit Ganguly*

- Implemented dynamic scheduling algorithm in Kubernetes, an open source container orchestration tool from Google
- To improve the overall cluster resource utilization using the new algorithm
  - Introduced a new parameter `softRequest` in the API which represents the general resource utilization
  - Fetched and used actual resource utilization metrics instead of solely relying on user specified values

## C# to MIPS Compiler

Jan 2015 – Apr 2015

*Compiler Design course project under Prof. Subhajit Roy*

- Implemented a C# to MIPS cross compiler with support for basic data types, arrays, conditional statements, looping statements, functions, recursion and object oriented features (classes and inheritance)

## Bike Sharing Demand Prediction

Jan 2015 – Apr 2015

*Machine Learning Techniques course project under Prof. Harish Karnick*

- Forecasted bike rental demand in Washington, D.C. using historical usage pattern and weather data
- Created an ensemble of Random Forest and Gradient Boosting based models after inspecting various models
- Designed features and implemented feature selection and hyperparameter tuning to further improve the accuracy
- Achieved rank 59 (top 2%) on Kaggle among 3000+ teams participating in the challenge worldwide

## Plankton Classification

Jan 2015 – Apr 2015

*Artificial Intelligence course project under Prof. Amitabha Mukerjee*

- Used Convolutional Neural Networks over GPUs to classify plankton images in one of the 121 classes
- Implemented feature engineering and data preprocessing techniques like offline and real time data augmentation etc.
- Evaluated and modified state-of-the-art network architectures and activation functions using Theano
- Achieved an accuracy of 74% compared to winning accuracy of 81% in Data Science Bowl 2015

## Cloud Storage and Syncing

Aug 2014 – Nov 2014

*Computing Laboratory course project under Prof. Arnab Bhattacharya*

Designed and developed a data storage and syncing service consisting of a web interface and a desktop client

- Implemented functionality to create/upload files and folders and share them with other registered users
- Also implemented chat and collaborative editing in shared folders via the web interface
- Designed a protocol for communication between desktop clients and server for two way data synchronization

## Extended NachOS

Aug 2014 – Nov 2014

*Operating Systems course project under Prof. Mainak Chaudhuri*

- Implemented system calls pertaining to Fork, Exec, Join, Yield, Sleep and Exit
- Implemented and benchmarked various job scheduling and page replacement algorithms

## Content Aware Mail Classifier

May 2013 – Jun 2013

*Summer Project under Programming Club, IIT Kanpur*

Created an automated mail classifier using Enron mail database, achieving accuracy upto 70% on balanced datasets

- Studied and implemented various supervised learning algorithms and Natural Language Processing techniques
- Built the testing and classification module using python and weka and a prototype for Gmail using Google Apps Script

## OPEN SOURCE PROJECTS

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Complete your Favorite FEED	A Node.js app which sends Atom/XML feed content over email periodically
GRE Vocab Feed	A chrome extension for mastering GRE vocabulary with hundreds of weekly active users
Hacker's Guide to ML	A repository of machine learning algorithms and their examples with more than 80 stargazers
Moody Trudes!	Machine Learning library to analyze person's mood based on social media updates
Online Store	An ecommerce platform consisting of Products Maintenance System, Catalog and Cart
Eduvate	A web app to help people master new language by improving vocabulary and pronunciation

## TECHNICAL SKILLS

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Languages	C++, Python, C, JavaScript, Ruby, Bash, Go, Oz, Octave
Frameworks/Libraries	Ruby on Rails, Node.js, jQuery, KnockoutJS, AngularJS
Platforms/Tools	Apache Pig, Docker, Kubernetes, RabbitMQ, AWS (EC2, RDS, S3, VPC, LB, EB, OpsWorks)

## POSITIONS OF RESPONSIBILITY

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- **Tutor, Introduction to Computing (ESC101):** Taught more than 35 students in weekly tutorials and problem solving sessions; Supervised TAs in labs and assisted the instructor in designing course material, quizzes, labs and exams
  - **Executive, Public Relations, Techkriti'14:** Led a team of more than 20 volunteers to organize talks, shows and exhibitions in the biggest festival at IIT Kanpur; Hosted 11 guest lectures, 13 exhibitions and 6 technical shows from 8 countries