

Kumar Kshitij Patel

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EDUCATION

IIT Kanpur | Kanpur, U.P. | B.Tech., CSE Expected May 2019 | CPI: 9.0/10 (After 2.5)

EPFL | Lausanne, Switzerland | Semester Exchange, Feb - July 2018

Shiv Jyoti School | Kota, Rajasthan | AISSCE 2015 | Score: 94.4%

Spring Wood School | Neemuch, M.P. | AISSE 2013 | CGPA: 10/10



ACHIEVEMENTS

- Awarded the prestigious Honda Yes Award 2017 by Honda Foundation, among the top 14 awardees in India, for academic and research excellence.
- Represented India in the "Youth Delegation to Nepal 2017" organized by the "Ministry of Youth Affairs and Sports". Nominated by the institute for among total 6 nominations all over for the academic year.
- Awarded the Academic Excellence Award for the year 2015-2016 at IIT Kanpur, among the top performing students at Institute Level.
- Part of the Institute Top Scorer, two men team "Paneer Pakora", in the Data Analytics competition "American Express-Analyze This 2016".
- Secured ALL INDIA RANK-200 in JEE Advanced 2015 out of 170,000 selected students.
- Secured 99.9 percentile in JEE Mains 2015 out of 1.3 million appearing students.
- Among top 1% of the students appearing in NSEC 2015. Selected for INChO 2015.
- Among top 1% of students in Rajasthan state of NSEP and NSEA 2015.
- Selected for second level examination of Ramanujan test 2014.
- Awarded institute all-rounder in 2011 in Spring Wood School, Neemuch.

INDUSTRIAL EXPERIENCE

DATA SCIENCE | INTERN, 3LOQ LABS, BITCHEMY VENTURES

December 2016 | Hyderabad, India

- Multi-class classification of customer comments over a phone call to automate the customer labeling process in banks.
- Merchant classification using transaction description of over 5 billion transactions. Learnt economic concepts of RFM modeling and market segmentation through the implementation.
- Used tools for data cleaning, imbalanced class sampling (SMOTE) and did manual feature engineering using relevance metrics.

RESEARCH EXPERIENCE

MULTI-ARMED BANDIT | DEVELOPED AND TESTED A NEW MAB ALGORITHM FOR GAUSSIAN BANDITS | DR. PURSHOTTAM KAR

January 2017 - Present | CS773 2016-17/II, Summer 2017, IIT Kanpur, Kanpur, India

- Submitted to ECML'18.
- Conducted experiments for rUCB algorithm while establishing it as the best MAB algorithm for Sub-Gaussians.
- Worked on a robust algorithm for contextual bandit setting.
- Tested multiple linear bandit algorithms against there developed robust counterparts.

STOCHASTIC OPTIMIZATION | A NON-ASYMPTOTIC ANALYSIS OF DISTRIBUTED SGD ALGORITHM | AYMERIC DIEULEVEUT, DR. MARTIN JAGGI

December 2017 - Present | Machine Learning and Optimization Laboratory, EPFL, Lausanne, Switzerland

- Submitted to NIPS 2018.
- Provided novel convergence rates for distributed SGD for different functional settings.
- Analyzed different convergence analysis of Stochastic Gradient Descent (Polyak Juditsky and classical) along with moment bounding analysis for SGD iterates.
- Did a complete literature survey of SGD, parallel SGD, importance sampling and mini-batch techniques.

PARAPHRASE GENERATION | TESTED AND IMPLEMENTED DEEP LEARNING ALGORITHMS FOR PARAPHRASE GENERATION | DR. PIYUSH RAI

August 2017 - November 2017 | CS772 2017-18/I, IIT Kanpur, Kanpur, India

- Preprocessed the simple wiki, Quora and MS COCO dataset, to make a huge paraphrase dataset.
- Implemented VAE for Paraphrase generation and Machine Translation on multiple data sets using Tensorflow and GoogleNMT.
- Implemented and tested multiple ANN techniques like attention, word drop-out, annealing etc.
- Analyzed the Paraphrase generation metrics, and the datasets to find the most appropriate metric for the task.

COGNITIVE ARCHITECTURE | ANALYSIS OF Z*-NUMBERS AND THE MACHINE MIND | DR. SANKAR K. PAL

May - July 2017 | Center for Soft Computing Research, Indian Statistical Institute, Kolkata

- NLP and Fuzzy Logic: Textual analysis of Z*-Numbers: Extraction and Consolidation.
- Studied knowledge representation and reasoning for machine-mind.
- Surveyed complete NLP procedures for text understanding.
- Compiled theories of emotion for machine-mind.

SPARSE LEARNING | ONE SHOT LEARNING IN HUMANS | DR. DEV PRIYA KUMAR

August 2017 - November 2017 | PSY 789 2017-18/I, IIT Kanpur, Kanpur, India

- Studied the AI algorithms for sparse learning in machines.
- Studied dozens of research papers on One Shot Learning both in Computer Science and Cognitive Science.
- Consolidated ideas and came up with a Non-parametric Bayesian Model for humans.

INFORMATION THEORY | DELIVERED A COURSE TALK ON RANDOM NUMBER GENERATION AND INFORMATION THEORY | DR. NITIN SAXENA

August - November 2016 | CS201 2016-17/I, IIT Kanpur, Kanpur, India

- Studied basics of information theory from 'pearls of discrete mathematics' and thermodynamic and information theoretic interpretations of entropy.
- Random number generation: pseudo and quasi variants.
- Use of random numbers in operating systems and entropy generation in OS.
- Books studied: 'Random Number Generation and Monte Carlo Methods' James E Gentle, 'Theory of information', 'Entropy, search complexity'.
- Briefly touched upon: Information theoretic aspects of machine learning.

OTHER PROJECTS

TIME SERIES ANALYSIS | ANALYSIS OF THE URBAN HEAT EFFECT IN GHENT, BELGIUM | DR. EMERIC THIBAUD

February - June 2018 | MATH-342, 2017-18/II, EPFL, Switzerland

- Stationarized the minute temperature data-set for Ghent, for six different locations.
- Applied SARIMA-GARCH style modeling to fit a descriptive time series model, using likelihood estimation.
- Provided complete residual analysis and used spectral methods to justify the model.

MACHINE LEARNING | SENTIMENTAL ANALYSIS OF MOVIE REVIEWS, FACE RECOGNITION USING EIGENFACES

January - April 2016 | Association of Computing Activities Projects 2015-16/II, IIT Kanpur, Kanpur, India

- Implemented Naïve Bayes Classifier on PIMA diabetes data set.
- Used Naïve Bayes Classifier and positive-negative word corpus for classifying movie reviews in NLTK corpus.
- Learnt about dimensionality reduction methods- PCA, SVD and implemented them on pictures.
- Implemented Face recognition using Eigen faces on 'Labeled faces in the wild' dataset.
- Used Neural Networks on MNIST data set for classification using Python.
- Other concepts learnt: kNN, decision trees, deep neural networks, linear regression, backpropagation, SVM.

ELECTRICITY CONSUMPTION AT IIT KANPUR | COMMUNITY WELFARE CELL PROJECT

May - July 2016 | CWC summer-16, IIT Kanpur, Kanpur, India

- Collected data on electricity consumption for the past 2 years and analyzed regions of maximum consumption.
- Calculated the expected savings from using devices such as LED bulbs and solar power panels.
- Reported the poor condition of thermal insulation in several buildings across campus.

BIODEGRADABLE WASTE CRUSHER TECHNICAL ARTS 201-202 PROJECT

IITK 2016/I&II

- Designed as a business product, 'bio-degradable waste crusher' for domestic use to eradicate the problem of waste storage and compost pre-processing.
- Modified to adapt it for dry leaves in IIT Kanpur.

RELEVANT COURSES

COMPUTER SCIENCE

- On-line Learning and Optimization
- Statistical Learning Theory (Lecture Series)
- Data Structures and Algorithms
- System Organization
- Quantitative Statistics Using R
- Computing Tools Laboratory
- Introduction to Block Chain and Crypto-currency
- Fundamentals of Computing
- Operating Systems
- Probabilistic Machine Learning
- Theory of Computation
- Advanced Algorithms
- Computer Vision*
- Natural Language Processing*
- Optimization for Machine Learning*
- Deep Learning*

MATHEMATICS AND HUMANITIES

- Introduction to Game Theory
- Probability and Statistics
- Discrete Mathematics
- Abstract Algebra
- Introduction to Logic
- Linear Algebra and ODE
- Multivariate Calculus
- Learning, Memory and Cognition
- Language and Society
- Time Series*
- Applied stochastic Processes*

(*Ongoing)

LANGUAGES

PROGRAMMING

Over 5000 lines:

Python • C • R • \LaTeX

Over 1000 lines:

HTML • C++ • CSS • Assembly

Familiar:

Matlab • Octave • Sqlite • HTML

Packages and Other Softwares:

PyTorch • TensorFlow • Scikit • Gensim/NLTK • Office

Operating Systems:

Windows • Linux

SPOKEN & WRITTEN

Native fluency:

English, Hindi

Reading fluency:

Sanskrit

Very-basic understanding:

Spanish, French

TEACHING EXPERIENCE

PROJECT MENTOR | COMPETITIVE MACHINE LEARNING | ASSOCIATION FOR COMPUTING ACTIVITIES PROJECT MENTOR

January - April 2017 | ACA, IIT Kanpur, Kanpur, India

- Supervised and taught basic machine learning principles.
- Taught some practical feature engineering tips.
- Helped through machine learning problems on competitive programming sites.

POSITIONS OF RESPONSIBILITY AND EXTRA-CURRICULAR ACTIVITIES

STUDENTS' SENATE

Senator BT/BS Y15, Students' Gymkhana (2016-17), senate nominee to Council of Student's Hostel Affairs, member of the ad-hoc committee on fee hike in IITs.

DUGC

Student nominee to the Departmental Undergraduate Committee, Computer Science and Engineering. Part of the Academic and Research Cell.

DEBATE AND DISCUSSION SOCIETY

Secretary for Debate and Discussions Society IIT Kanpur. Part of the team ranked 42nd at 14th NLS Debate held at Bangalore, biggest Asian parliamentary debating competition of India. Participated in the IITD debate 2016 and IITD Rendezvous 2015 debate and speaking events. Participate in the 10th NUJS Parliamentary Debate at Kolkata.

COUNSELING SERVICE

Student Guide: Helped in conducting orientation for more than 800 incoming freshmen and personally helped 6 students to acclimatize to the new academic environment.

ANTARAGNI-16

Event coordinator Junoon'16, the fusion rock band competition of Antaragni- managed a Rs. 4 Lakh event with participation of over 50 bands, supervising a team of 15 people.

VOX POPULI

Core team member, Vox Populi (2015-2017) the campus Journalism Society of IIT Kanpur.

RAKTARPAN

Undergraduate HEAD, Raktarpan 2016-17: IIT Kanpur NGO that works in blood donation. Involved in organization of more than 5 camps.

HINDUSTANI AND WESTERN MUSIC

4-Year training in North Indian Classical Music by Gandharva Sangeet Mahavidhyalaya, Mumbai. Participated in musical events at the institute, conducted vocal training workshop and an active member of the music club.