

Prabhat Agarwal

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Education

2013–2017 **B.Tech (Hons.) in Computer Science and Engineering, IIT Kharagpur, West Bengal.**

CGPA: 9.93/10 (Dep. Rank: 1, Inst. Rank: 2)

Publications

2017 **P. Agarwal**, A. Sharma, J. Grover, M. Sikka, K. Rudra, and M. Choudhury, "I may talk in english but gaali toh hindi mein hi denge: A study of english-hindi code-switching and swearing pattern on social networks," in *Communication Systems and Networks (COMSNETS), 2017 9th International Conference on*, pp. 554–557, IEEE, 2017. <https://doi.org/10.1109/COMSNETS.2017.7945452>.

Work Experience

Jun 2017 – **Analyst**, Goldman Sachs.

- Present
- Designed and developed a tool to help resolve write conflicts during replication in firm's proprietary multi-master globally replicated database. Achieved a performance improvement of 1000% over the existing tool.
 - Developed a proof of concept for a scalable, highly available distributed database service to allow trade booking and real-time risk calculation for all businesses of the firm with sub-millisecond read-write latencies.

May-Jul 2016 **Summer Analyst**, Goldman Sachs.

- Developed a module system, following JDK9's module specifications, for firm's platform based on JDK8 providing interoperability between several JVM languages and firm's proprietary language.
- Designed a JSON specification to define a module's communication contract, enhanced the platform's distributed build system to enforce the contract during the build and designed a custom Java runtime using Java class-loader hierarchy to enforce encapsulation at runtime.

May-Jul, 2015 **Summer Intern**, Dr. D B Phatak, IIT Bombay.

- Developed a web-based application (codzilla.org.in) to help in basic programming language courses.
- The application provides a platform to curate various types of questions and allows a user to compile and execute their solutions.

Key Projects

Jul 2016 – **FactRanker: Automatic Ranking of check-worthy claims**, *B.Tech Thesis*, Dr. Pawan Goyal and
Apr 2017 Dr. Saurabh Bagchi (Purdue University).

- Curated a dataset of political debates from the 2016 US Presidential election campaign annotated using all major fact-checking media outlets.
- Designed a system FactRanker to rank claims by their check-worthiness using the score of an SVM classifier trained on text (e.g. POS tags, sentiment, word dependencies) and contextual features (e.g. topic, sentence homogeneity).
- Improved the then state-of-the-art (ClaimBuster) in ranking check-worthy claims by 21.7% in NDCG@100.

Jan-May 2017 **Stance Classification of News Articles**, *B.Tech Thesis*, Dr. Pawan Goyal.

- Designed a classifier using bidirectional conditional encoding with word-by-word attention to classify if an article agrees, disagrees or is neutral to a given statement or headline.
- Achieved an accuracy of 74.52%, an improvement of 10.1% over the baseline model using text features.

Jul 2015 – **Code switching and swearing patterns on social media**, Dr. Pawan Goyal and Dr. Monojit
Jan 2016 Choudhury (Microsoft Research, India).

- Developed a rule-based classifier (with 72% precision) to detect swears in Romanized Hindi and English tweets.
- Used phonetics to match swears in Romanized Hindi to account for large spelling variations in transliteration.
- Studied correlation of topic, gender, location, and language preferences while swearing.

Jan-Apr 2016 **Citation Recommendation based on citation contexts**, Dr. Pawan Goyal.

- Developed a system to recommend scientific articles to cite in a paper for queried citation context.
- Used popular IR algorithms like tf-idf, BM25, LSA, query expansion, etc.
- Achieved a Mean Reciprocal Rank (MRR) of 0.2 on a test dataset of 1000 scientific articles.

- Jul-Nov 2016 **Anomaly Detection in Surveillance Video Feeds**, Dr. Pabitra Mitra.
- Used Time Series analysis over frame level feature representation to detect anomalous frames in stationary surveillance videos.

Other Projects

- Jul-Nov 2016 **Automated Abstract generation of Scientific Articles using Deep Learning**, Dr. Pawan Goyal.
- Used Para2Vec to learn low dimensional representations of individual sections of scientific articles.
 - Modelled document as a sequence of sections and employed Sequence to Sequence model of LSTMs on the learned representations to generate abstractive summary.
- Jan-Apr 2016 **Online Course Management System**.
- Created a web-based application aimed at self-paced learning featuring online course design, text, and video-based course content, course calendar publishing, automated quizzes and exams, discussion forums, and e-mail communication.
- Jul-Nov 2015 **Compiler for TinyC**.
- Built a compiler for TinyC (language having subset of features of C) targeted at x86_64 architecture using Flex and Bison.

Awards and Achievements

- 2017 Awarded Bigyan Sinha Memorial Endowment Prize for being the second best student in order of merit in the graduating B.Tech (Hons.) batch of 2017, IIT Kharagpur
- 2017 Awarded Institute Silver Medal for being the best student in order of merit among the graduating B.Tech (Hons.) degree in Computer Science and Engineering
- 2017 Won bronze medal in Opensoft (inter hostel tech competition) for developing a distributed web-based photo-sharing app using blockchain.
- 2015 Awarded Sachinandan Basak Memorial Endowment Prize for best National Social Service (program aimed at developing rural areas near institutes) volunteer student of the year 2014-15 among about 400 students.

Technical Experience

- languages C, C++, Java, Python, JavaScript, Haskell
- machine learning tools scikit-learn, gensim, Tensorflow
- others NLTK, gdb, Git, network and systems programming

Relevant Coursework

- Fundamentals Algorithms, Probability & Statistics
- Systems Operating Systems, Computer Organization & Architecture, Database Management Systems, Parallel & Distributed Algorithms
- Artificial Intelligence Artificial Intelligence, Machine Learning, Information Retrieval, Social Computing, Speech & Natural Language Processing, Deep Learning

Extra Curricular Activities

- 2013–2017 **Member, The KGPian Game Theory Society, IIT Kharagpur**.
- Published an article Inheritance and Game Theory in The Strategist, the newsletter of the society about an application of multi-person prisoner's dilemma in real life.
 - Developed an online multiplayer game based on multi-round Split or Steal for society's annual event, War of Wits (with a participation of around 500).
- 2015–2017 **Student Mentor, IIT Kharagpur**.
- Mentored a group of 5 freshmen in academic and non-academic activities to ease their transition into college life.
- 2013–2015 **Volunteer, National Service Scheme (NSS), IIT Kharagpur**.
- Assisted in teaching underprivileged students in village schools and organized several awareness drive for social and environmental issues.