Prabhat Agarwal

Analyst, Goldman Sachs

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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)

2013 **Indian School Certificate Examination (ISC)**, Maria's Day School, Howrah, West Bengal.
Aggregate: 96.83%

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 - Present **Analyst**, Goldman Sachs.
- 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 - Apr 2017 **FactRanker: Automatic Ranking of check-worthy claims**, *B.Tech Thesis*, Dr. Pawan Goyal and 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 SVN 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 NDGC100.

Jan-May 2017 **Stance Classification of News Articles**, *B.Tech Thesis*, Dr. Pawan Goyal.
- Designed a classier using bidirectional conditional encoding with word-by-word attention to classify if an article agrees, disagrees or is neutral to statement or headline.
- Achieved an accuracy of 74.52%, an improvement of 10.1% over the baseline model.

Jul 2015 - Jan 2016 **Code switching and swearing patterns on social media**, Dr. Pawan Goyal and Dr. Monojit 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`.

Mar 2015 **PlotIt**, Opensoft (Inter hostel tech competition), IIT Kharagpur.

- Team (of 10) secured 4th place in the competition.
- Designed and developed UI using PyQt for PlotIt, a tool to plot graphs in 2D and 3D.

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.

2016 Received J.C. Ghosh Memorial Endowment Prize for securing highest CGPA in the department at the end of 6th semester.

2016 Secured 1st position in a team of 4 in event Code-O-Shuffle (online programming competition) in Kshitij (annual techno-management fest), IIT Kharagpur, 2016.

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`

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 Thoery` 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 which saw the participation of around 500 people.

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*.

- Team Leader of the gold winning unit in NSS Annual Camp 2014 and group leader for the academic session 2014-15.