Tushar Gupta

4th Year Undergraduate Student
Major : Dept. of Chemical Engineering
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Academic Qualifications

Year	Degree/Certificate	Institute	C.G.P.A / %
2013 - Present	Integrated Dual Degree [B.Tech+M.Tech]	Indian Institute of Technology Kharagpur	**8.5 / 10** (upto 6th semester)
2013	Class XII Board (CBSE)	St. John's Sr. Sec. School Kota	**94.8 %**
2011	Class X Board (CBSE)	St. Paul's Sr. Sec. School Kota	**10 / 10**

Skills and Experience

Programming Languages	Python, C, HTML5, R, PHP, LaTex, CSS
Software	Matlab, Vim, UNIX Terminal Environment, Git (Version Control), Windows
Development Tools	Natural Language Toolkit **(NLTK 3.0)**, Jupyter **IPython Notebook**, XAMPP [PHP Development Environment], MySQL, RStudio [IDE]

Scholastic Achievements

- Stood among the **top 3%** in the **Joint Entrance Examination Advanced Examination** conducted by the Indian Institute of Technology **2013**
- Achieved **All India Rank - 1813** in **Joint Entrance Examination Mains** among 12 Lakh students **2013**
- Selected under the **Kishore Vaigyanik Protsahan Yojana (KVPY)** [translated to: Young Scientist Encouragement Scheme] fellowship program conferred by the **Indian Institute of Science Bangalore** **2013**
- Scored in the **top 10%** in **National Standard Examination Chemistry** by Homi Bhabha Center for Science Education, Tata Institute of Fundamental Research , Mumbai **2013**
- Secured **All India Rank 101** in **National Science Talent Search Examination** by Unified Council **2010**

Projects / Work Experience

Affix-Sense Disambiguation, *Natural Language Processing* [Present]

Guide : *Prof.* Pawan Goyal (IIT KGP) Lab : **CNeRG - Complex Networks Research Group**

- The project aims to learn rules for predicting the underlying **source word** and the **sense** which the **affix** represents for a given **derived word** formed by them.
- Various models as in the **Facebook FastText** and **Word2Vec** were also trained on the **English Wikipedia Corpus** to obtain morphologically rich **word-embeddings.**
- **Compositional Semantics** was used to evaluate over the **word representations** obtained through the use of **distributional methods** such as **PMI**(Pointwise Mutual Information) and those mentioned above.

Context aware Recommendation System [Present]

Guide : *Prof.* Pawan Goyal (IIT KGP)

- The system returns **relevant citations** in a given **research document** for **specific query locations**.
- It incorporates **in-link** and **out-link** contexts for a citer, cited pair to match with a relevant document using different **word-vector models**.
- Various methods for computing similarity and candidate set generation have been **innovated** to improve upon the baseline performance

Named Entity Recognition for Microblogging

Guide : *Prof.* Pabitra Mitra (IIT KGP)

- Performed **Extraction and Disambiguation** of named entities such as Person, Location, Organisation etc.
- Category Information from **Freebase** was linked to the **extracted entities** for using as **additional features** in classification
- A Bag of words model was used for **training** over a **annotated dataset of tweets** in different domains

Recommendation System for Biomedical Research papers

- Parsed over **1,00,000 research papers** using python's **BeautifulSoup Library** to obtain a citation network
- Used method of **Random Walk with restarts** over citation network for research papers to recommend the most suitable paper based on a user entered query paper
- The output was grouped into subcategories using the **Sections and Topical Information** for calculating relevance scores

Stochastic Optimal Control of Seeded Batch Crystallizer, *Numerical Optimization*

Guide : *Prof.* Debasis Sarkar (IIT KGP)

- Implemented **Deterministic control** using the **Stochastic Maximum Principle** to obtain particle size distribution of a **seeded batch crystallizer**
- Used **Matlab** to model the **Population Balance equations** for deriving the optimal temperature profile
- Integrated **uncertainties** in the **system parameters** through the use of **Stochastic Ito processes**

Internship

ITC Limited - Summer Internship 2016

- Offered a full time working position as a **Pre Placement Offer** after the completion of internship
- Implemented methods for improvising operation of utilities such as Boiler, Refrigeration, Water Treatment Plant
- **Mitigated losses** for **consumption of energy** in steam, chilled water, heated water, etc. improving **efficiency**
- Achieved a projected savings of **₹ 5,00,000 /-(7351 USD)** per annum through various suggestions

Relevant Coursework

- Algorithms – I (Theory + Lab)
- Programming and Data Structures (Theory + Lab)
- Computer Aided Process Engineering (Theory + Lab)
- Machine Learning
- Mathematics – I & II
- Computer Methods in Chemical Engineering
- Speech and Natural Language Processing
- Information Retrieval
- Transform Calculus
- Product Development

Extra- Curricular Activities

Head, Student Welfare Group IIT Kharagpur (2014- Present)

- Ensured efficient organization of **Programming and Data Structures Doubt Sessions** for first year students in collaboration with the **Computer Science and Engineering Department, IIT Kharagpur**
- Organized **R – Programming Workshop** along OrangeTree Global with over 200+ student participation
- **Developed** institute's **Fresher's Forum** for student doubts and **Official SWG website** www.swgiitkgp.in
- **Promoted** as the **Advisor** and the overall head for the subsequent years of operation

Code fun do, Hackathon (2015)

- Developed a money splitting app in 2 - Day long **Hackathon** hosted by **Microsoft**
- The app helped in managing finances in group transactions, thus made lending and sharing money easier