SHUBHAM GUPTA

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Major: Chemical Engineering | Minor: Industrial & Management Engineering and Linguistic Theory

EDUCATIONAL QUALIFICATION

Year	Degree/Certificate	Institute	CPI/%
2018 - Present	B.Tech.	Indian Institute of Technology Kanpur	8.2/10.0
2017	AISSCE	Nalanda Academy, Kota	85.4%
2015	AISSE	S.R. Public School, Kota	10.0/10.0

SCHOLASTIC ACHIEVEMENTS

- Awarded the **Kishore Vaigyanik Protsahan Yojana (KVPY)** Fellowship by the Department of Science and Technology, GOI
- Achieved an **All India Rank 11** in **Indian National Earth Science Olympiad** conducted by Geological Society of India, GOI
- Attended **Vijyoshi** National Science Camp, mentored by Nobel laureates, organised by KVPY & INSPIRE, held at IISER Kolkata
- National Talent Search Examination (**NTSE**) first stage qualified from Rajasthan, conducted by NCERT, Government of India
- Attended **Training Camp** of Indian National Earth Science Olympiad, organised by **Geological Society of India**, Govt. of India

INTERNSHIP EXPERIENCE

ZEVI.AI | NLP Engineer Intern | *Advanced AI Team* ***July'21-Ongoing***

OBJECTIVE	• Construct an **In-Site search engine** solving the **conversion problem** (increase purchases) for online shopping
STRATEGY	• Accessed user search & store product data of several stores with **210-450 variables** for **exploratory data analysis** • Engineered **ngram** queries & labels, embedded them using transformer & tracked **10+ ML** models for classification • Moved classification search to **AWS-Lambda** & created **autocomplete, query suggester & spell-checker** modules
RESULTS	• Reduced **latency** of search codebase by over **70% to** less than **200 milliseconds** by use of optimal data structures • Improved **test accuracy** for ML model by over **60%** using **MLP Classifier** to compute probability for search queries • Assisted the company in converting **5+ new online stores** over **2 months** from **the USA, the UK, Germany & India**

RESEARCH PROJECTS & PUBLICATION

*publication awaited **course project

Modelling and Simulation of Electrochemical Systems *(Prof. Raj Pala, CHE Dept., IIT K)* ***Jan'21-April'21***

OBJECTIVE	• Model and simulate an electrochemical system to achieve a net **zero to negative carbon emissions** footprint
STRATEGY	• Analysed finite difference method to discretise coupled differential equation of mass transfer & chemical reactions • Remodelled **2 systems** (Cu electrowinning & fuel cell) using **Butler-Volmer** equation to get e^- density at electrodes • Considered activation, ohmic, & conc. polarisation to create the 2 systems with **simulation & experiment gap < 5%**
RESULTS	• Rectified **copper membrane electrode assembly** utilising simulations for CO_2 reduction using boundary conditions

Genetic theory of code-switch evolution *(Prof. Mayank Singh, CSE Dept., IIT GN)** ***Sept'20-Ongoing***

OBJECTIVE	• Generate **code-mixed sentences** using English and corresponding Hindi sentences using **Genetic Algorithm**
STRATEGY	• Formulated initial population of **19780 code-mixed sentences** by **transliteration (Devanagari to Roman)** & switch • Translation for **mutations** was incorporated using **googletrans; crossover** was implemented using a **word-aligner** • Operated the GA over **100 generations** for each sentence, **LaBSE** transformer was used as embedder for **selection**
RESULTS	• **Perplexity** of our model came out to be **4098, beating the Microsoft April'21 results** by a difference of 52 points

Text-Based Analysis of Financial Constraints *(Prof. Suman Saurabh, IME Dept., IIT K)* ***July'20-Aug'20***

- Objective was to quantise the **financial constraints** and study their impact on small-capital companies in the Indian market
- Manoeuvred NLP techniques like **tokenisation** & **lemmatisation** to process **400+** machine-readable annual reports of firms
- Critiqued between the **equity, debt, private-placement** focused delay of investment by finding **180+ specific words** in data

Portfolio Optimization using Markowitz Model *(Prof. Shankar Prawesh, IME Dept., IIT K)** ***Feb'21-April'21***

- Inspected the distribution and time-series characteristics of **NIFTY50** data using **Shapiro Wilk Test** and **Chi-Square Statistics**
- Modelled a Markowitz Portfolio to assign weights to the stocks and generated the **Efficient Frontier** with **5+ years** of data
- Used **SML** to determine under/overpriced stocks, tested portfolio virtually realising **20% profit** on **INR 10 million** of capital

RELEVANT COURSES & TECHNICAL SKILLS

COURSES	Process Control | Chemical Engineering Design| Chemical Reaction Engineering | Heat Transfer | Mass Transfer
SKILLS	**Programming:** C | C++ | Python | MATLAB | R **Databasing:** MySQL **Utilities:** Git | AWS | AutoCAD | HTML | PyTorch

LEADERSHIP POSITIONS

Coordinator | Finance & Analytics Club ***April'20-April'21***

LEADERSHIP	• Lead a **team of 25 members**, managed FB group of **2.6K members** & **budget of INR 95K** to promote finance
INITIATIVES	• Executed **month-long workshops** on Algo Trading, ML in Finance & Derivative Markets with **650+ participated** • Organised **5 summer and 2 winter projects** ranging from predicting stock prices to the fundamental analysis • Administered **FinFest** with various IITs which consisted of **2 workshops, 2 competitions,** prizes worth **1.8 lakhs**
IMPACT	• Introduced a **Pan-IIT Crypto trading competition** influencing the campus community towards crypto-currency

Student Nominee | Department Undergraduate Committee | Chemical Engineering ***April'20-Ongoing***

- Advised **350+ students** about course curriculum & monitored the progress of **10+ academically weak students** of the dept.
- Fabricated **a web application** to generate multiple timetables of a semester & keeping preferences of **21 professors** intact

EXTRACURRICULAR ACTIVITIES

SOCIAL	• **Student Guide:** Mentored **4 freshman** & coordinated orientation program for **900+** in a team of **175** student • **Tech. Head,** Department of Chemical Engineering: **Designed** and revamped the existing **website** of the dept.
SPORTS	• **Secretary, Games & Sports Council:** Scheduled, supervised & judged **Udghosh** and inter-hall badminton matches • **BADMINTON:** Won **2nd place** at inter-hall badminton competition **(Inferno)** at IIT Kanpur, 2019