Aditya Chetan

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EDUCATION

- **Indraprastha Institute of Information Technology, Delhi**
  B. Tech., Computer Science and Applied Mathematics; CGPA: 9.10
  New Delhi, India
  Aug. 2016 – Present

- **Lal Bahadur Shastri Sr.Secondary School**
  High School; Percentage: 94.8%
  New Delhi, India
  2014 – 2016

PUBLICATIONS

- **Aditya Chetan***, Brihi Joshi*, Hridoy Sankar Dutta*, Tanmoy Chakraborty. CoReRank: Ranking to Detect Users Involved in Blackmarket-based Collusive Retweeting Activities. In *12th ACM International Conference on Web Search and Data Mining (WSDM 2019)*. (Acceptance Rate: **16%**, CORE2018 A*)

- Hridoy Sankar Dutta, **Aditya Chetan***, Brihi Joshi*, Tanmoy Chakraborty. Retweet Us, We Will Retweet You: Spotting Collusive Retweeters Involved in Blackmarket Services. In *The 2018 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2018)*. (Acceptance Rate: **15%**)

- Nishtha Madaan, Gautam Singh, Sameep Mehta, **Aditya Chetan***, Brihi Joshi*. Generating Clues for Gender based Occupation De-biasing in Text. `arXiv:1804.03839 [cs.CL]`.

* Equal contribution

SKILLS

- **Relevant Courses**: Machine Learning, Natural Language Processing, Linear Algebra, Linear Optimisation, Scientific Computing, Numerical PDEs, Differential Geometry, Probability and Statistics, Real Analysis, Analysis and Design of Algorithms, Discrete Mathematics, ODEs & PDEs, Stochastic Processes and Applications

- **Languages**: `Python, Java, C#, C++, Go`

- **Tools & Technologies**: `Sci-kit Learn, NLTK, NumPy, SpaCy, Pandas, Flask, JQuery, git, MS Visual Studio, MATLAB, MVC, Tensorflow, Docker`

RESEARCH EXPERIENCE

- **D5, Max-Planck Institute for Informatics**
  Research Fellow
  Saarbrücken, Germany
  July 2019 - Present

  ○ **Inferring and Modelling Users' Interests from Conversational Text**:
  Advised by: Dr. Paramita Mirza and Dr. Andrew Yates

    * Working on extracting preferences of users from conversational data to offer personalized recommendations
    * Applying the idea to a Travel Chat Bot for offering travel related recommendations using users' travel history
    * Building a universal knowledge base containing domain knowledge for travel recommendations
    * **Keywords:** *Natural Language Processing, Reinforcement Learning, Knowledge Bases*

- **Laboratory for Computational Social Systems (LCS2)**
  Undergraduate Researcher
  New Delhi, India
  Jan 2018 - Present

  ○ **Understanding adversarial collusive activities in OSNs**:
  Advised by: Dr. Tanmoy Chakraborty

    * Worked on detecting collusive retweeters on Twitter, focusing on users of freemium services
    * Curated an open data set of manually annotated users from various freemium services
    * Proposed a novel set of features for detection and tested its effectiveness on several machine learning models
    * Developed an unsupervised and semi-supervised approach for detection of collusive retweeters
    * **Keywords:** *Machine Learning, OSNs, Data Science*

- **Indraprastha Institute of Information Technology, Delhi**   New Delhi, India
  Undergraduate Researcher   *May 2018 - August 2018*
  - **Cost Optimisation in Transportation**:
    Advised by: Dr. Pravesh Biyani
    - ∗ Worked on developing methods to optimize the cost of allotting vehicles on transportation demand data
    - ∗ Studied past work on coloring algorithms for dense graphs and analysed them for our use case
    - ∗ Developed a dynamic programming solution for allotment of vehicles so as to optimize cost
    - ∗ Developed a web API that runs our solution on the provided input data
    - ∗ **Keywords:** *Optimisation, Graph Coloring, Linear Programming, Flask*

- **IBM India Research Laboratory**   New Delhi, India
  Undergraduate Researcher   *Nov 2017 - March 2019*
  - **Complex Answer Retrieval**:
    Advised by: Dr. Sumit Bhatia
    - ∗ Working on the problem of Complex Answer Retrieval.
    - ∗ Did a literature survey on existing approaches to artificial Q&A.
    - ∗ Currently exploring meticulous IR approaches to help improve accuracies of downstream DL models in Q&A.
    - ∗ **Keywords:** *NLP, Complex Answer Retrieval, IR, Deep Learning*
  - **Persuasive Style Transfer**:
    Advised by: Dr. Deepak Padmanabhan (QU, Belfast)
    - ∗ Detecting and removing *"persuasiveness"* quality in political speeches.
    - ∗ Modelled the detection and removal of *"persuasive"* quality in text as an optimisation problem.
    - ∗ **Keywords:** *NLP, Machine Learning, Deep Learning*
  - **Occupational Debiasing** [**code**][**paper**]:
    Advised by: Dr. Sameep Mehta
    - ∗ Developed a system for detecting Occupational Gender Bias in text, taking into account the influence of demography and time-frame.
    - ∗ Developed and curated a dataset comprising of various occupation names and occupational evidences.
    - ∗ Proposed a pipeline that detects potential gender bias in occupations.
    - ∗ **Poster accepted at GHCI 2018**
    - ∗ **Keywords:** *NLP, Machine Learning, Flask*

WORK EXPERIENCE

- **Philips India Ltd.**   Bengaluru, India
  Research Intern   *May 2019 - July 2019*
  - **Radiology & Cardiology Informatics Team**:
    - ∗ Worked on project, Narrative AI, a system aimed at extracting information and clinical entities from conversations in clinical settings.
    - ∗ Developed a web app as an end-to-end system to record conversations, handwritten text and display entities.
    - ∗ Developed a digital prescription board to identify medical terms from Handwritten text.
    - ∗ Developed an NLP pipeline incorporating text-preprocessing, clinical NER, and information extraction.
    - ∗ Surveyed Clinical NER with its challenges through existing research papers.
    - ∗ **Keywords:** *Data Science, NLP, Healthcare, Gooogle Cloud Service APIs, Flask, Python, HTML5, MetaMap*

- **Microsoft India**   Hyderabad, India
  Global Delivery Intern   *June 2017 - July 2017*
  - **Member of the Emerging Capabilities group**:
    - ∗ Worked on developing and integrating chat-bots into the workflow of the MS Sales team, to help handle clients
    - ∗ Learned in detail about `C#`, the `.NET` framework and `MVC` framework to develop web apps using Agile methodology
    - ∗ Developed an FAQ chat-bot for new hires of my team from scratch
    - ∗ Learned how to use Azure Cloud Services to deploy apps and gained experience in troubleshooting deployed apps
    - ∗ **Keywords:** *Chat-bots, Microsoft Bot Framework, Microsoft Azure, Agile, C#, .NET*

Awards

- **Dean's Award for Academic Excellence**: Awarded to students for excellent academic performance for the academic year 2018-19.
- **Google Travel Grant**: Awarded full travel support of 2800 USD for visiting WSDM 2019
- **Dean's Award for Innovation R&D**: Awarded to students who work on Research projects beyond coursework. Awarded for the academic year 2017-18
- **Best Technical Poster Runner-up at GHCI 2018**: Received for the project, "Generating Clues for Gender based Occupation De-biasing in Text"

Projects

- **DiffGeoOps** [code]:
  - A Python Library for calculating discrete curvatures for 2D manifolds.
  - Can generate plots of Mean Curvature, Gaussian Curvature and Principal curvatures for given 3D meshes.
- **Virtual Element Methods** [code]:
  - Read and understood the Virtual Element Methods for solving Partial Differential Equations.
  - Implemented a solver for two dimensional Poisson equation on general polygonal meshes in Python.
- **img2LATEX** [demo][code]:
  - An end-to-end model for converting handwritten mathematical expressions to compilable LATEX
  - Made use of image segmentation, supervise classifiers such as CNNs, SVM, etc. and heuristics for code formation
  - Developed as a course project for Machine Learning (CSE343) at IIIT Delhi in Monsoon 2018
  - **Keywords:** *Machine Learning, Deep Learning, Image Processing*
- **SemEval19 Task 3 : EmoContext**:
  - Worked on the task of contextual emotion detection in text. This was a shared task for a workshop at ACL 2019.
  - Used deep learning models like LSTMs, DeepMoji and ElMo for trying to increase accuracy.
  - **Keywords:** *NLP, Contextual emotion detection, Deep Learning*
- **IEDatron** [demo][poster]:
  - This project aims to improve a human's ability to control a robot, through a robot that copies its actions
  - Uses Computer Vision techniques with `Microsoft Kinect v1.8`, and controlled with the help of `Arduino Mega`, `HC-05` Bluetooth module and Servo brackets
  - Was amongst the top 10 projects in the first-year batch and received a mention in the Director's blog [link]
  - **Keywords:** *Computer Vision, Robotics, IoT*
- **Chain Reaction** [code]:
  - A JavaFX-based MacOS application based on the famous Android-based game
  - Includes features like undo, resume and multiplayer mode
  - **Keywords:** *JavaFX, GUI, MacOS, Java, Object-oriented programming*

Co-curricular Activities

- **Volunteering:**
  - **IIITD Summer Camp 2017:** Was part of the volunteer group of the annual Summer camp at IIIT Delhi, where middle-school children from Govt. schools are introduced to different concepts in Mathematics, Computer Science, General studies, etc. and counselled about their future career prospects. This initiative was applauded by the Govt. of New Delhi. [coverage]
- **Talks**:
  - **Mathematics of ML**: An DIY talk to demonstrate the mathematics behind basic machine learning models. Delivered at a Women Who Code Delhi meetup. [notebook]
  - **Maths in LATEX**: A short talk on how to use LATEX for writing mathematical content delivered at the Évariste Mathematics club at IIIT Delhi. [slides]
- **Clubs**
  - Founding member of the Évariste Maths club at IIIT Delhi. Link to the club's ideation doc: [link]