

# Somesh Singh

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🐦 @someshsingh22 | 🎓 Somesh

## Education

### Birla Institute of Technology and Science, Pilani

B.E. (HONS.) IN COMPUTER SCIENCE

Goa, India

Aug 2018 - Present

- **CGPA** - 7.86/10
- **Relevant Coursework** - Object Oriented Programming, Data Structure & Algorithms, Database Systems, Machine Learning, Operating Systems, Natural Language Processing, Computer Architecture, Cognitive Neuroscience, Linear Algebra, Probability and Statistics, Computer Programming, Theory of Computation
- **Teaching Assistant** - BITS F464 **Machine Learning**, CS F469 **Information Retrieval**, CS F111 **Computer Programming**

### City Montessori School

JUNIOR, SENIOR YEAR

Lucknow, India

Aug 2008 - March 2018

X (ICSE) - 92.2% | XII (ISC) - 96%

## Work Experience

### MIDAS Labs, IIIT Delhi

RESEARCH AND DEVELOPMENT INTERN

Delhi, India

April 2020 - Current

- Researched gradient estimation based white-box **adversarial attacks** on Automatic Essay Scoring (AES) systems with customized policies using Tensorflow and Pytorch.
- Analysing the effect of **morphology** on Transformers and how their embedding space is partitioned in correlation with morphology and vocabulary.
- Worked on generating data free adversaries, investigating dataset bias and worked on post-hoc protection mechanisms against adversarial attacks.
- **Supervised by** Prof. Rajiv Ratn Shah (Dept. of CSE & HCD, IIIT Delhi).

### MySmartPrice Web Technology

DATA ANALYST AND SOFTWARE DEVELOPMENT INTERN

Hyderabad, India

May 2020 - July 2020

- Built Knowledge-based active and passive **recommendation systems** using Bayesian and Non-Bayesian methods using Java, Python, Django and RESTful APIs.
- Built and deployed overall **Social Media Crawling** tools utilizing Docker container using Java, Python and Selenium integrated with cloud and parallel computing.
- **Supervised by** Sitakanta Ray, Co-Founder at Zariance and MySmartPrice.

### CSIS Department, BITS Pilani

TEACHING ASSISTANT)

Goa, India

Jan 2020 - Current

- **CS F111 - Computer Programming** - Conducted and evaluated labs and tutorial session for the course and mentored 1000+ first year undergrads **Supervised by** Dr. Neena Goveas.
- **CS F469 - Information Retrieval** - Responsible for conducting research discussions, assignments and tutorials of the course and mentored pre-final and final year undergrads **Supervised by** - Dr. Swati Agarwal.
- **BITS F464 - Machine Learning** - Responsible for conducting labs, assignments and projects of the course **Supervised by** - Dr. Ashwin Shrinivasan. and **Prof. Tirthraj Dash**

## Publications

### BPGC at SemEval-2020 Task 11: Propaganda Detection in News Articles with Multi-Granularity Knowledge Sharing and Linguistic Features based Ensemble Learning

Workshop Paper

SEM-EVAL-2020, INTERNATIONAL WORKSHOP ON SEMANTIC EVALUATION

2020

Rajaswa Patil\*, Somesh Singh\*, Swati Agarwal

## Honors & Awards

2017 **Merit Scholar**, National Standard Examination of Chemistry, Homi Bhabha Centre for Science Education

Mumbai, India

## Projects

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### DecepticoNLP

*Adversarial Machine Learning*

OPEN SOURCE PROJECT, LEAD DEVELOPER

March 2020 - Present

- DecepticoNLP is a Python based PyTorch Wrapper for robustness monitoring and adversarial debugging of NLP models powered by Travis CI.
- DecepticoNLP has implementations of various character & word level adversarial perturbations for text.
- **URL:** <https://github.com/SforAiDl/decepticonlp>

### FlaiReddit

*Natural Language Processing*

MACHINE LEARNING WEBAPP

Apr 2020

- Built a complete text classification web-app using Python and PyTorch and deployed it on Heroku which scrapes data from Reddit, pre processes and classifies its flair tag using Transformers.
- The data extractor extracts posts from a wide time period to eliminate the Bias towards some hot topics and compares runtime and implements a minimal bayes classifier.
- **URL:** <https://github.com/someshsingh22/FlaiReddit-MIDAS>

### TeamEleven

*Machine Learning, Sport Analysis*

COLLEGE PROJECT: BITS F464

December 2020

- NRR (Net Run Rate) Gaussian Noise Regularised Auto-Encoders for Player Embeddings in Cricket using PyTorch.
- We introduce a regularised autoencoder-based approach to generate on the fly player/team embeddings, which considers players' previous performance (form) to predict the outcomes of a match with a comparable accuracy (76%). We also predict the loss's margin in terms of Net Run Rate (NRR) instead of win/lose to get a more confident measure.
- **URL:** <https://github.com/someshsingh22/TeamEleven>

### Symbolic Learning

*Symbolic Learning, Capsule Networks*

INFORMAL PROJECT, APPCAIR & TCS

December 2020

- Circuit Solver - Used Capsule Networks and SCAE based approaches to learn parts of electric circuit diagrams with an artificially generated dataset and transferred it on real world test data.
- **URL:** <https://github.com/someshsingh22/Circuits>

### Sherlocked

*Natural Language Processing*

INDEPENDENT PROJECT

May 2019

- Built a text generator using LSTMs, Attention Mechanism and Transformers with TensorFlow trained on prose like Sherlock Holmes, Harry Potter and poems by John Keats.
- The project also demonstrates the joint training on Sherlock Holmes and Harry Potter to highlight the successes and failures in performance on training on semantically different literature.
- **URL:** <https://github.com/someshsingh22/Sherlocked>

### Snake-AI

*Reinforcement Learning*

INDEPENDENT PROJECT

Jan 2019

- Built A double DQN based self learning snake environment and agent using PyGame and Keras with extensive hyper parameter tuning and reward engineering.
- **URL:** <https://github.com/someshsingh22/Snake-AI>

## Tech-Stack

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<b>Toolkits</b>	Numpy, Scikit-Learn, PyStan, Tensorflow, PyTorch, Linux, MacOS, HTML, CSS, JS, Django, Flask
<b>Programming Languages</b>	DSA, DBMS, OS, OOP C/C++, Java, Python, Julia, $\text{\LaTeX}$

## Leadership & Committees

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2021	<b>Core Member</b> , AXON - BITS Goa	Goa, India
2020	<b>Events Head - PoR</b> , Center for Technical Education	Goa, India
2020	<b>Core Member</b> , Society of Artificial Intelligence and Deep Learning	Goa, India
2020	<b>Speaker</b> , IEEE, Research in Computer Science	Goa, India
2020	<b>Instructor</b> , Applications in Deep Learning	Online, India
2020	<b>Instructor</b> , Quark, Machine learning & Deep learning	Goa, India
2020	<b>Leader</b> , Language Research Group	Goa, India