

|| 26- 28th March, 2021 ||



# INTER IIT TECH MEET'21

IIT Guwahati

**HIGH PREP EVENT**  
*(400 Points)*

## BRIDGEi2i'S AUTOMATED HEADLINE AND SENTIMENT GENERATOR

Digital content is expanding at a very rapid pace. Many activities that experts undertake today involve the ability to process digital content and synthesize them to make decisions. This is a complex activity that experts have mastered over decades of experience and expertise. This problem explores a foundational aspect of enabling machines to assist experts in taking decisions by helping them synthesize digital content effectively.

# PROBLEM STATEMENT:

Automated identification, summarization, and entity-based sentiment analysis of mobile technology articles and tweets.

## CONTEXT:

Digital content is expanding at a very rapid pace. Many activities that experts (like editors, auditors, judges, doctors, underwriters) undertake today involve the ability to process digital content (emails, articles, reports, videos, tweets, etc.) and synthesize them to make decisions. This is a complex activity that experts have mastered over decades of experience and expertise.

This problem explores a foundational aspect of enabling machines to assist experts in taking decisions by helping them synthesize digital content effectively.

## PROBLEM:

- 1) Develop an intelligent system that could first identify the theme of tweets and articles.
- 2) If the theme is mobile technology then it should identify the sentiments against a brand (at a tweet/paragraph level).
- 3) We would need a one-sentence headline of max of 20 words for articles that follow the mobile technology theme. A headline for tweets is not required.

The articles and tweets would be in multiple languages (will focus on English, Hindi, Hinglish, as a start).

## Input Dataset:

- 1) A mix of 4000 newspaper articles in English, Hindi & Hinglish along with their headlines will be provided.
- 2) A mix of 4000 tweets in English, Hindi & Hinglish will be provided.

Data would be shared in a CSV format with the students. List of themes/topics for classification with corresponding #tag. Students have to scrap the tweets corresponding to the #tag.

## Infrastructure:

Google Colab notebook with Python/R code, Readme.txt file, Requirement.txt file is preferable. No paid API or Services should be used.

## Skills Required:

Advanced NLP & Deep Learning, Web-scraping, Knowledge of any coding platform (Python, R, etc)

## OUTPUT:

- 1) Binary Classification of the article & tweets to a 'mobile\_tech' or 'other' theme
- 2) For all articles and tweets where the classified theme is 'mobile\_tech' you would need to identify the brand name and its corresponding sentiment at a tweet/paragraph level. For e.g. Tweet -> 'Apple phones have a better battery life compared to Samsung phones #APPLEROCKS #SAMSUMGSUCKS' should recognise Apple & Samsung as two brands along with positive & negative sentiment for them respectively
- 3) Automatically generated headline on 'mobile\_tech' themed articles in English, Hindi & Hinglish
- 4) Approach note summarizing the algorithmic approach used for developing the solution, other solutions evaluated and considerations behind the choice of this specific approach

## EVALUATION:

A dataset of 100-500 articles & tweets in English, Hindi & Hinglish will be used to validate all the algorithms and approaches adopted. Following would be the key criteria:

- 1) Theme classification evaluation: Precision, Recall and F1 Score.
- 2) Entity based sentiment evaluation: Accuracy of Brand identification and Precision, Recall and F1 Score Sentiment
- 3) Automated Headlines evaluation: (Note: The generated Headlines need to be in English irrespective of the language in the article)
  - a. Average similarity scores of AI-generated headlines compared with actual headlines would be used as a metric for evaluation. Embedding based similarity score generating code will be shared
  - b. Rough and BLEU score ([https://en.wikipedia.org/wiki/ROUGE\\_\(metric\)](https://en.wikipedia.org/wiki/ROUGE_(metric))) (<https://en.wikipedia.org/wiki/BLEU>). Code for the same will be shared
- 4) Scoring Speed of all three algorithms (Ensure that the runtime is stored in a variable which can be called out later)
- 5) Innovative approach
- 6) Scalability of a solution to another language

A sample output dataset with 10-20 articles and tweets will be shared for your understanding. Make sure the output is in the given format. No adherence to the required structure would lead to disqualification.

*Please note that we will provide final testing data ~ 1 day before the final submission date. There will be interim connects required to see and evaluate intermediate output.*

# THE EVALUATION WOULD BE CONDUCTED IN 3 STEPS:

- (A) Preliminary Report Submission - 100 Points
- (B) Final Code Submission - 200 Points
- (C) Presentation - 100 Points (Top 10 teams only)

## Preliminary Report Submission (100 pts):

**Due Date: 21st March EOD**

Share an approach note talking about the process adopted to solve the problem. Key insights, model performance if any.

Evaluation metrics:

- End to End Workflow - Solution Architecture (1 to 5)
- Innovation (1 to 5)
- Scalability (1 to 5)

An overall score would be computed which would be a simple average of the above three metrics. The report needs to be submitted in PDF format. It should not exceed 5 pages (excluding the Cover Page).

## Final Code Submission (300 pts):

**Due Date: 23rd March EOD**

- Theme classification evaluation: Precision, Recall, and F1 Score
- Entity based sentiment evaluation: Accuracy of Brand identification and Precision, Recall and F1 Score Sentiment (Note: The Brand names need to be in English irrespective of the language in the article)
- Automated Headlines evaluation: (Note: The generated Headlines need to be in English irrespective of the language in the article)
- Average similarity scores of AI-generated headlines compared with actual headlines would be used as a metric for evaluation. Embedding based similarity score generating code will be shared
- Rough and BLEU score ([https://en.wikipedia.org/wiki/ROUGE\\_\(metric\)](https://en.wikipedia.org/wiki/ROUGE_(metric))) (<https://en.wikipedia.org/wiki/BLEU>).
- Scoring Speed of all three algorithms (Ensure that the runtime is shared in the final approach doc)
- Innovative approach
- Scalability of the solution to other languages

## Evaluate the performance across all metrics:

### Formula

$0.4 \times (\text{F1 score of Mobile Tech Classification}) +$   
 $0.2 \times (\text{Accuracy of Brand Identification}) +$   
 $0.2 \times (\text{F1 score Sentiment Analysis}) +$   
 $0.2 \times (\text{Average Similarity Score})$

*The top 10 teams will be shortlisted based on the former 2 submissions and would be called for the final presentation on the 27th of March 2021.*

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|---|-------------------|
| <b>Date of Release of Top 10 Teams:</b>         | <b>26th March</b> |
| <b>The date for Presentation (Top 10 only):</b> | <b>27th March</b> |

The Judging Panel for the presentation would be the Senior Leadership Team at Bridgei2i. You are expected to give an overview of your submission along with the impact and feasibility of your solution.

## FINAL SUBMISSION

All participating teams would be required to give presentations of their proposed solution on **27th March or 28th March**

The submission needs to be mailed at [submissions@interiit-tech.org](mailto:submissions@interiit-tech.org)

Please note that the Final presentation should wrap up within 15 minutes which will be followed by Q&A (5 min).

A maximum of 10 participants (per team) shall be awarded participation /merit certificate.