

# Building a News Bias Detection Browser Extension: Insights from Research

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# Introduction

**Problem:** The abundance of online news makes it difficult to distinguish objective reporting from biased content.

**Impact:** News bias can influence public opinion, possibly causing polarization and misinformation.

**Solution:** A browser extension that automatically detects news bias, empowering users to critically evaluate online news sources.

# Source 1 – Pre-training of Deep Bidirectional Transformers for Language Understanding

## Key Concepts:

- ▶ **BERT (Bidirectional Encoder Representations from Transformers):** A powerful model that understands context in both directions within a sentence.
- ▶ **Fine-tuning:** Adapting a pre-trained BERT model for specific tasks, such as detecting bias.

## Contributions to the Extension:

- ▶ **Bias Detection Model:** Fine-tune BERT to detect subtle linguistic cues of bias.
- ▶ **Technical Implementation:** The paper's details on BERT's architecture and training process help guide the implementation of the bias detection model.

## Source 2 – Neural Media Bias Detection Using Distant Supervision With BABE

### Key Concepts:

- ▶ **BABE Dataset:** A high-quality dataset with expert-annotated labels to identify bias in text.
- ▶ **Distant Supervision:** Leveraging existing data, such as political leanings of news outlets, to pre-train models.

### Contributions to the Extension:

- ▶ **Training Data:** The BABE dataset provides valuable, expert-annotated data for model training.
- ▶ **Pre-training Strategy:** Apply distant supervision using political leanings to improve the model's bias detection capabilities.

# Source 3 – Assessing the Generalizability of Transfer Learning Effects in Media Bias Detection

## Key Concepts:

- ▶ **Generalizability:** The ability to transfer learned patterns from training data to new topics in media bias detection.
- ▶ **Human vs. Machine Labels:** The effectiveness of human versus machine-generated labels for training bias detection models.

## Contributions to the Extension:

- ▶ **Training and Testing Strategies:** The paper's methodology on separate training and testing phases can inform the evaluation process of the extension.
- ▶ **Labeling Insights:** Guidance on choosing the most effective labeling strategy for bias detection training.

# Source 4 – Decoding News Bias: Multi Bias Detection in News Articles

## Key Concepts:

- ▶ **Multi-Bias Detection:** Identifying various types of bias beyond single-bias detection.
- ▶ **LLM-based Dataset Annotation:** Using large language models (LLMs) to create a multi-label dataset for different types of bias.

## Contributions to the Extension:

- ▶ **Expanding Bias Categories:** The extension can be designed to detect a wider range of biases, offering a more comprehensive analysis of news articles.
- ▶ **Dataset Creation:** Use LLM-based techniques to annotate a diverse dataset for multi-bias detection.

# Source 5 – Automatic Text Summarization: A Comprehensive Survey

## Key Concepts:

- ▶ **Automatic Text Summarization (ATS):** Techniques for creating concise summaries of documents while preserving essential information.
- ▶ **Extractive vs. Abstractive Summarization:** Extractive summarization selects important sentences, while abstractive summarization rephrases content.

## Contributions to the Extension:

- ▶ **Summary Generation:** Use ATS to generate concise summaries of detected biases for users, enhancing understanding.
- ▶ **Highlighting Biased Content:** Implement extractive summarization to highlight biased sentences or phrases in articles.

# Source 6 – Headline Attention Network for Political Bias Detection

## Key Concepts:

- ▶ **Headline Attention:** Analyzing headlines as a key indicator of bias in news articles.
- ▶ **Political Bias Detection Dataset:** A dataset of Telugu news articles annotated for political bias.

## Contributions to the Extension:

- ▶ **Headline Analysis:** Prioritize headline analysis as an initial step for detecting bias, leveraging its effectiveness as shown in the study.
- ▶ **Cross-Lingual Adaptation:** Adapt the methods used for political bias detection in Telugu news to work with English-language content.



# Source 7 – Automatic Text Summarization

## Key Concepts:

- ▶ **Genetic Algorithms (GA) and Mathematical Regression (MR):** Techniques for automatic text summarization and feature extraction.
- ▶ **Feature Extraction for Summarization:** Identifying key features that contribute to selecting important sentences.

## Contributions to the Extension:

- ▶ **Feature Engineering:** Insights from GA and MR can be used to identify linguistic features indicative of bias in news articles.
- ▶ **Alternative Summarization Techniques:** Explore GA and MR as methods to generate summaries for detected biases, offering a more nuanced understanding.

# Conclusion

**Synergy of Sources:** Combining insights from these research papers creates a solid foundation for developing a robust news bias detection browser extension.

**Potential Impact:** The extension will enhance media literacy, encourage critical thinking, and promote informed public discourse.

**Future Directions:** Ongoing research into NLP, bias detection, and user interface design will continue to refine the extension's functionality and effectiveness.

# Thank You!

**Q & A:** Open the floor for any questions or further discussions.