
Political Opinion Mining using Recurrent Neural Network, 2018

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Motivation

- ❖ Politicians express their views on various issues
 - ❖ Scrutinized for everything they say on media
 - ❖ Important to understand their overall sentiment on the issue
 - ❖ Aim is to find the if a politician is in agreement or Disagreement on a particular topic
 - ❖ To the best of our knowledge no work has been done on the sentiment analysis of the Indian politicians
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Motivation

- ❖ GST: Does this party support implementation of GST?
 - ❖ Ram Mandir: Does this party support building of Ram Mandir?
 - ❖ GDP: Is this party convinced of India's GDP growth?
 - ❖ Demonetisation: Does this party support implementation of Demonetisation?
 - ❖ Cauvery SC Verdict: Does this party support quick implementation of Cauvery verdict?
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Literature Survey

- ❖ Identifying Stance by Analyzing Political Discourse on Twitter by Kristen Johnson and Dan Goldwasser [1]
 - First work to use the twitter data

 - ❖ Actionable and Political Text Classification using Word Embeddings and LSTM by Adithya Rao and Nemanja Spasojevic [2]
 - Used Word embeddings and LSTM
 - Classifies tweets as Democrats or Republicans

 - ❖ Political Ideology Detection Using Recursive Neural Networks by Mohit Iyer, Peter Enns , Jordan Boyd-Graber , Philip Resnik [3]
 - Convote dataset (Thomas et al., 2006) consists of US Congressional floor debate transcripts
 - Classify as Conservative, Liberal, Neutral
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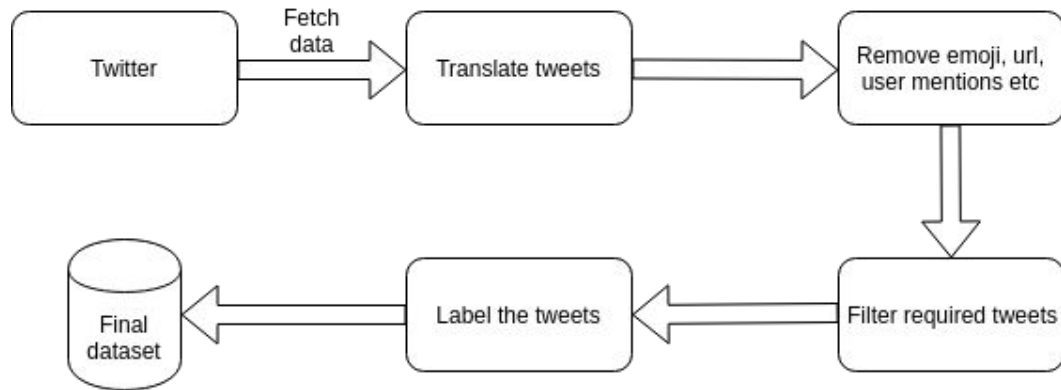
Literature Survey...contd

- ❖ Modeling of Political Discourse Framing on Twitter by Kristen Johnson, Di Jin, Dan Goldwasser [4]
 - Twitter dataset

 - ❖ Political Bias Analysis by Arkajyoti Misra and Sanjib Basak [5]
 - Uses LSTM network
 - Data: Ideological Books Corpus (IBC)

 - ❖ Automatic detection of political opinions in Tweets by Diana Maynard and Adam Funk [6]
 - Determine the political leanings from pre-election tweets
 - No use of machine learning algorithm
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Dataset creation



- ❖ No publicly available dataset
 - ❖ Created a list of **154 Indian Politicians** and **15 Party Handles**
 - ❖ We fetched total **2.8 lakhs** tweets using **tweepy** with **~3200 tweets per Twitter Handle**.
 - ❖ Extracted original tweets for quoted retweets to get the context
 - ❖ Translated the tweets from local languages to English using Google Translate API
 - ❖ Preprocessed URL, user mention, emojis to be considered as separate tokens
 - ❖ Manually found current topics, their keywords and stance of various parties
 - ❖ Labelled tweets based on keywords of issues and stance
 - ❖ Final count: 8356 tweets for 24 issues
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Dataset stats

Issues	Keywords
GST	GST
GST	gstfornewindia
GST	gst4newindia
GST	one nation one tax one market
Demonetisation	Demonetisation
Demonetisation	Demonetization
Demonetisation	Black money
Demonetisation	fake currency
Demonetisation	demonetised
Ram Mandir	ram mandir
Ram Mandir	WeNeedRamMandir
Ram Mandir	babri masjid
Ram Mandir	ram janmabhoomi
Ram Mandir	RamMandir
reservation	SC/ST
reservation	OBC
reservation	backward class
Cauvery SC Verdict	Cauvery
Cauvery SC Verdict	CauveryWaterManagement
Cauvery SC Verdict	Cauvery Management Board
Cauvery SC Verdict	CauveryIssue

Party	Tweets
AAP	52
AIADMK	181
AIMIM	44
Akali Dal	36
BJP	3721
BJD	7
DMK	139
INC	3177
Janata Dal	192
Janata Party	1
Marxist	164
NCP	150
RJD	81
SP	43
Shiv Sena	81
TMC	271
TDP	16

Dataset stats

Stance	Tweets
Agreement	4853
Disagreement	2848
Neutral	655

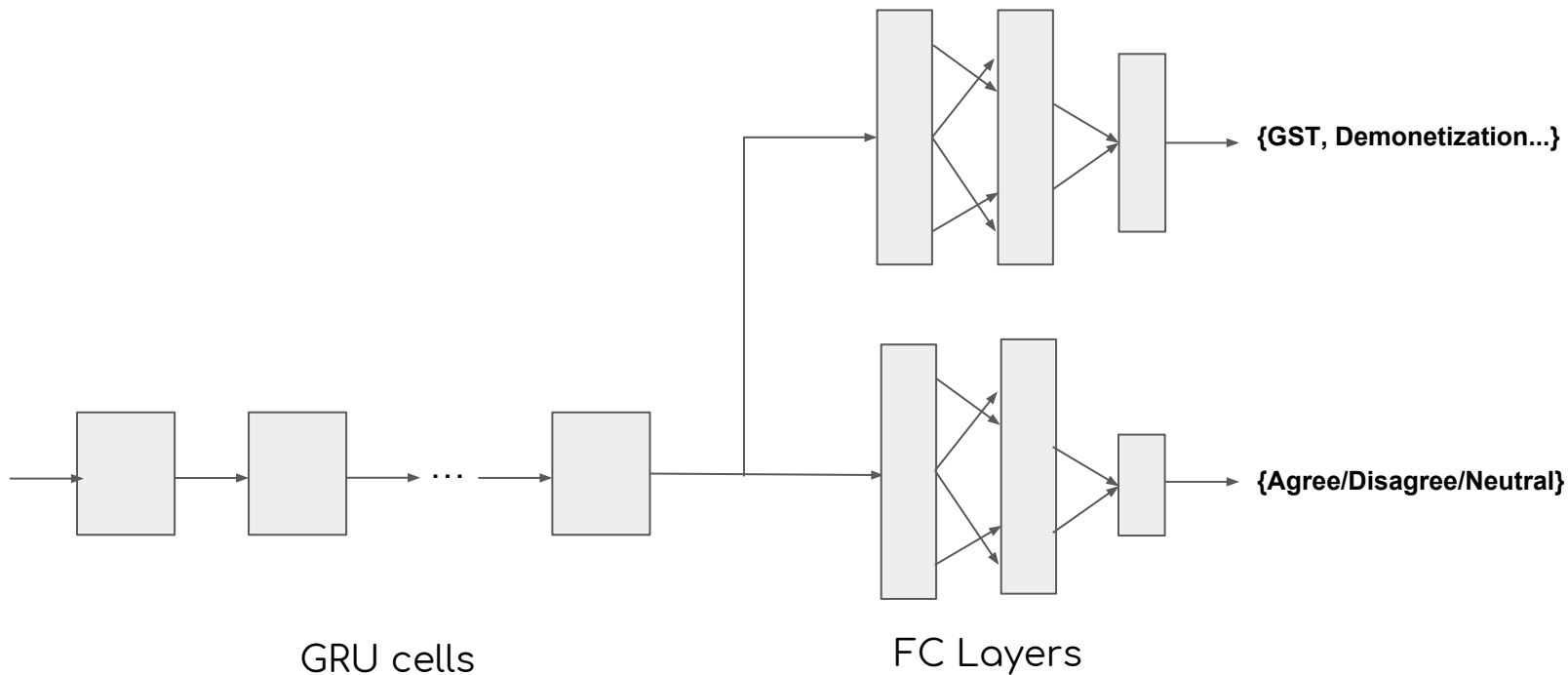
Issue	Tweets
Aadhar linking	158
Beef Ban	148
Cauvery SC verdict	183
Demonetisation	1429
EVM tampering	193
FDI Policy	189
Fodder Scam	71
GDP Growth	397
GST	2937
Inflation control	254
Jallikattu Ban	35
PNB Scam	367
Padmavati Screening	111
Ram Mandir	262
Right To Privacy	39

A peek into dataset

	Tweet	UserHandle	Party	Issue	Stance
10	i am so happy that political discourse in del ...	ArvindKejriwal	AAP	Padmavati film screening	Neutral
11	politics differences apart here is wishing USE...	ArvindKejriwal	AAP	GST	Disagreement
12	had a very useful session wid trader reps to t...	ArvindKejriwal	AAP	GST	Disagreement
13	business takes a hit as excess gst paid gets l...	ArvindKejriwal	AAP	GST	Disagreement
14	this committee comprising local traders will b...	ArvindKejriwal	AAP	GST	Disagreement
15	dmk has caused injustice to farmers in the cau...	CMOTamilNadu	AIADMK	Cauvery SC Verdict	Agreement
16	the dmk may have set up a cauvery management b...	CMOTamilNadu	AIADMK	Cauvery SC Verdict	Agreement

Model Architecture

- ❖ Multihead Classification
- ❖ Backpropagate Average Loss



Training

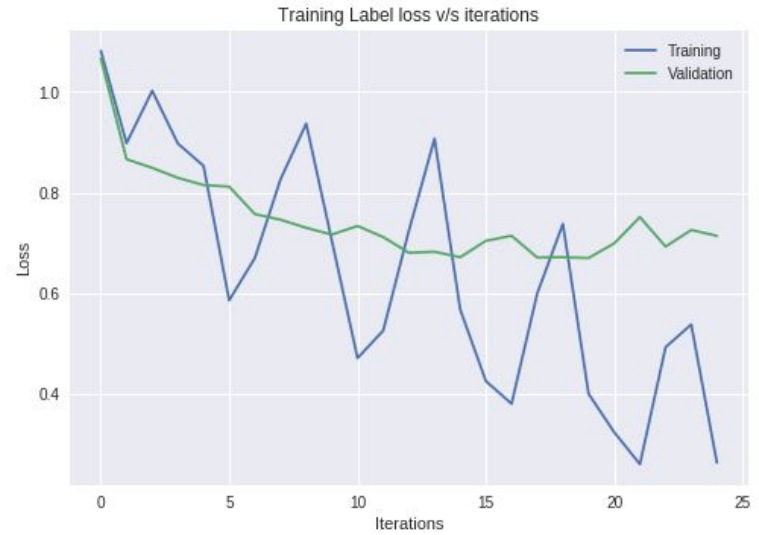


Fig (1): Training and validation loss v/s iterations for Issue and Stance prediction

Results

	<i>Issue Prediction</i>	<i>Stance Prediction</i>
<i>Test BCE Loss</i>	0.334	0.676
<i>Test Accuracy</i>	91.51%	75.60%
<i>F-Score</i>	0.914	0.746

Results

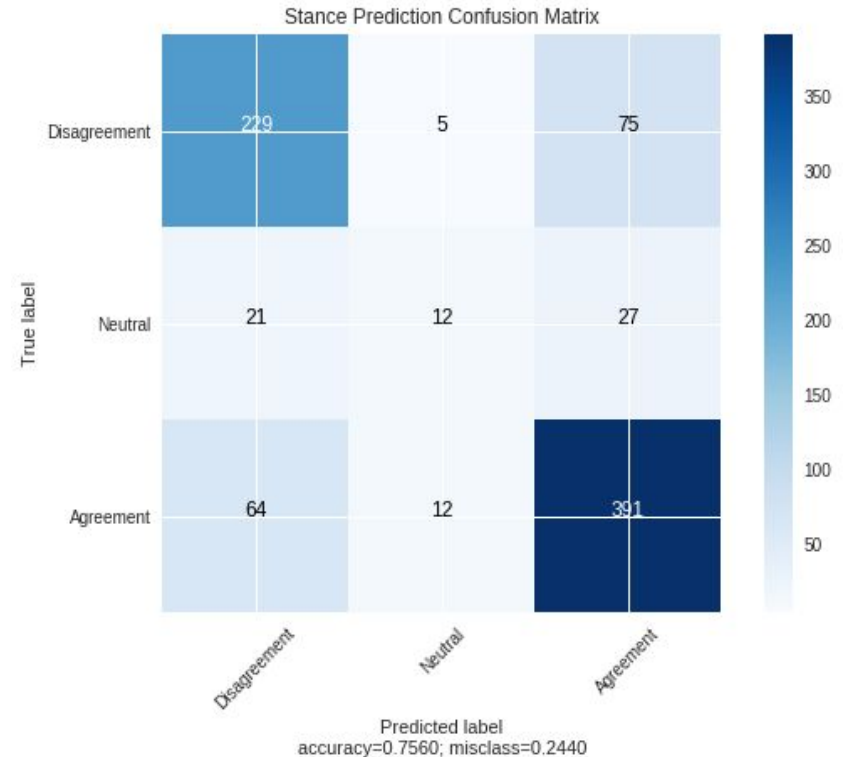
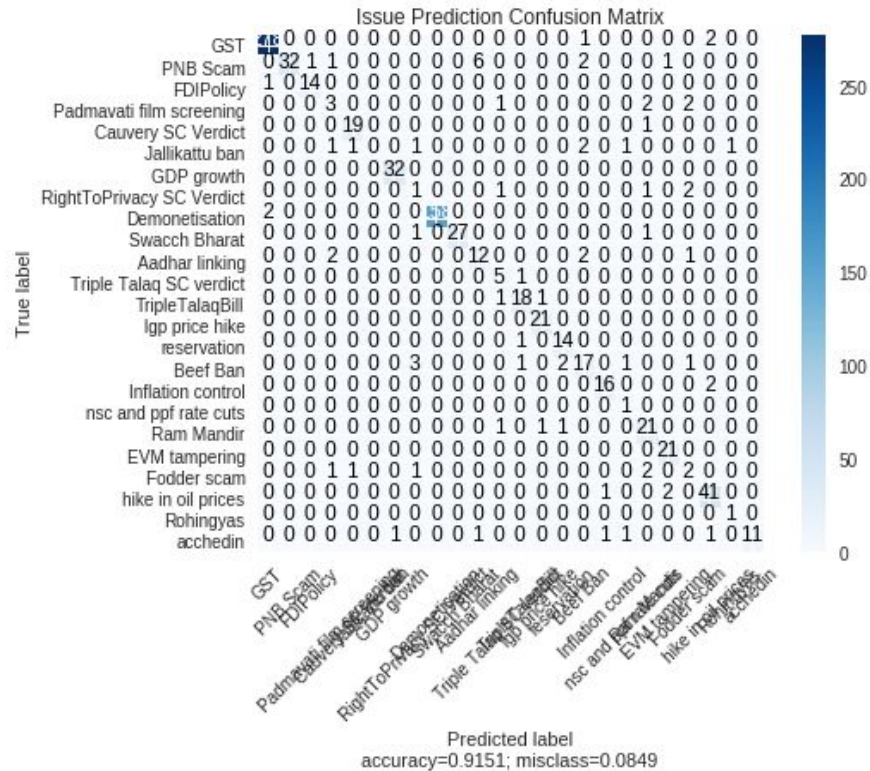


Fig (2): Confusion matrix for Issue and Stance Prediction

References

- [1] Kristen Johnson and Dan Goldwasser, Identifying Stance by Analyzing Political Discourse on Twitter, in EMNLP 2016
 - [2] Adithya Rao and Nemanja Spasojevic, Actionable and Political Text Classification using Word Embeddings and LSTM, in WISDOM 2016
 - [3] Mohit Iyyer, Peter Enns , Jordan Boyd-Graber , Philip Resnik, Political Ideology Detection Using Recursive Neural Networks, in ACL 2014
 - [4] Kristen Johnson, Di Jin, Dan Goldwasser, Modeling of Political Discourse Framing on Twitter, in ICWSM 2017
 - [5] Arkajyoti Misra and Sanjib Basak, Political Bias Analysis, CS224d Stanford Project
 - [6] Diana Maynard and Adam Funk, Automatic detection of political opinions in Tweets, in ESWC 2011
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THANK YOU !
