

# Explorer

[How to use this site](#)

## Topics

- Global attitudes towards GBV
- World Bank
- Information Hub
- Female Reproductive Health
- Tools and Data

## Welcome to the tools page

### Tools to address GBV

This section contains various tools to understand and address GBV. Tools include:

- Tweet classifier:** to address GBV issues, it helps to understand the nature of the issue
- GBV image identifier:** Concerned that a family member or friend has suffered GBV? This image classifier may help.

### Motivation for webbased tools

There are several reasons why we have incorporated tool along with source code directly into the website:

- Non data scientists can harness the tools to address GBV problems that they face
- Data scientists with an interest in addressing GBV through tool creation can leverage the source code provided to build their own tools
- Community engagement with the tools and source code may lead to improvement in the tools functionality, training data and model quality. This can be see as community source code 'crowd funding'.

Overall, the above 3 outcomes result in tools designed to address GBV becoming more **accessible** which is one of this websites critical goals.

### Tools description

#### Tweet classifier

A concern with issues such as GBV is that people may not be aware that certain types of GBV exist, for example, work place gender discrimination. However, when individuals are faced with troubles they may give clues through their social media, such as twitter.

Therefore, a text processing module has been built to classify texts as a variety of as having a form of GBV. These forms include:

- Rape
- Child marriage
- and many other forms, detailed below

#### GBV image identifier

There are a few purposes for this module. Firstly, the tool may be used to identify and react to GBV. In addition, an issue in machine learning is data collection which reflects a real-world scenario. Since the data comes from google scrapes I would be concerned that the original model may not be may not be trained on appropriate data. Therefore, images may be collected to train future models when users test this module. The benefit of 'real-world' images is that they are more likely provide training data where results can be replicated more closely in the future.

Prior to saving user's uploaded images, there will need to be consideration into how to protect privacy and how to ethically use the model.

+ Tweet classifier

The tweet classifier has been specifically developed to classify tweets into one of several categories, which include:

- Rape
- Physical force
- Humiliation
- Deny /lost job despite qualified
- Lost /denied/job due to refused sex
- Sex without consent
- Defile
- FGM
- Insult
- Child marriage
- Abuse
- Spank buttocks

Although this model targets tweet classification, other texts can also be classified.

Paste tweet or type text that you would like to classify

Classify Text

+ View model code

```
# Categories relate to gender based violence
# In addition creating a model used on our website, this code serves as a tutorial

# package used to store objects on your disk
# used to write text classifying model for later use
import pickle

# package for data manipulation and analysis
import pandas as pd

# fastai is the package we use to create a text classifier
# it's an easy to use package
# in particular, it comes with a model that has already been trained to understand english
# therefore, all we need to do is train the model to classify gbv tweets
# this is called transfer learning
from fastai.text.all import (
    TextDataLoaders,
    language_model_learner,
    AWD_LSTM,
    accuracy,
    text_classifier_learner,
)

# Read in text data - only a sample is required to train and validate the model
tweets = pd.read_csv('data/landing_zone/TwitterDataSets/Set3/Tweets.csv').sample(frac=0.75)

# prepare the data for fastai use
# we are going to train our model to predict 'semi type' classes (GBV type) using the text column
# 20% of the data is used for validation to verify our results
dls_lm = TextDataLoaders.from_df(
    tweets,
    text_col='tweet',
    label_col='semi_type',
    valid_pct=0.20,
    bs=64,
    is_lm=True
)

# Firstly, we teach our language model to understand the style of text in tweets
learn = language_model_learner(dls_lm, AWD_LSTM, drop_mult=0.3)
learn.fit_one_cycle(3, 1e-2)
learn.save_encoder('finetuned')

# Secondly, we teach our model to predict types of GBV in tweets
# like above, we first prepare data for fastai package use
dls_clas = TextDataLoaders.from_df(
    tweets,
    valid_pct=0.2,
    text_col='tweet',
    label_col='semi_type',
    bs=64,
    text_vocab=dls_lm.vocab
)

learn = text_classifier_learner(dls_clas, AWD_LSTM, drop_mult=0.5, metrics=accuracy).to_fp16()
learn = learn.load_encoder('finetuned')

# graph which helps us determine our models appropriate learning rate
# initially set to 2e-3 = 0.002
learn.lr_find()

# Accuracy = 0.814628 after first iteration of fitting model
learn.fit_one_cycle(1, 2e-3)

# Accuracy - 0.960643 after second iteration of fitting model
learn.freeze_to(-2)
learn.fit_one_cycle(1, 3e-3)

# Accuracy - 0.999 after second iteration of fitting model
learn.freeze_to(-4)
learn.fit_one_cycle(1, 5e-3)

with open('data/processed/tweets/tweet_classifier.pickle', 'wb') as handle:
    pickle.dump(
        learn,
        handle,
        protocol=pickle.HIGHEST_PROTOCOL
    )
```