



Twitter Role Classification

“The Bluebirds”

Gregory Solomon Pickett, Kenneth Worden and Adam Wilborn

CS 4624 - Multimedia, Hypertext, and Information Access Edward A. Fox
Virginia Tech, Blacksburg VA 24061

05/8/2019





Outline

1. Client
2. Project goals
3. Development
4. Results
5. Testing/User Evaluation
6. Demo
7. Acknowledgements

Client



Liuqing Li

- PhD candidate working in Digital Library Research Laboratory (DLRL) at Virginia Tech
- Wrote a paper on role-related user classification on Twitter

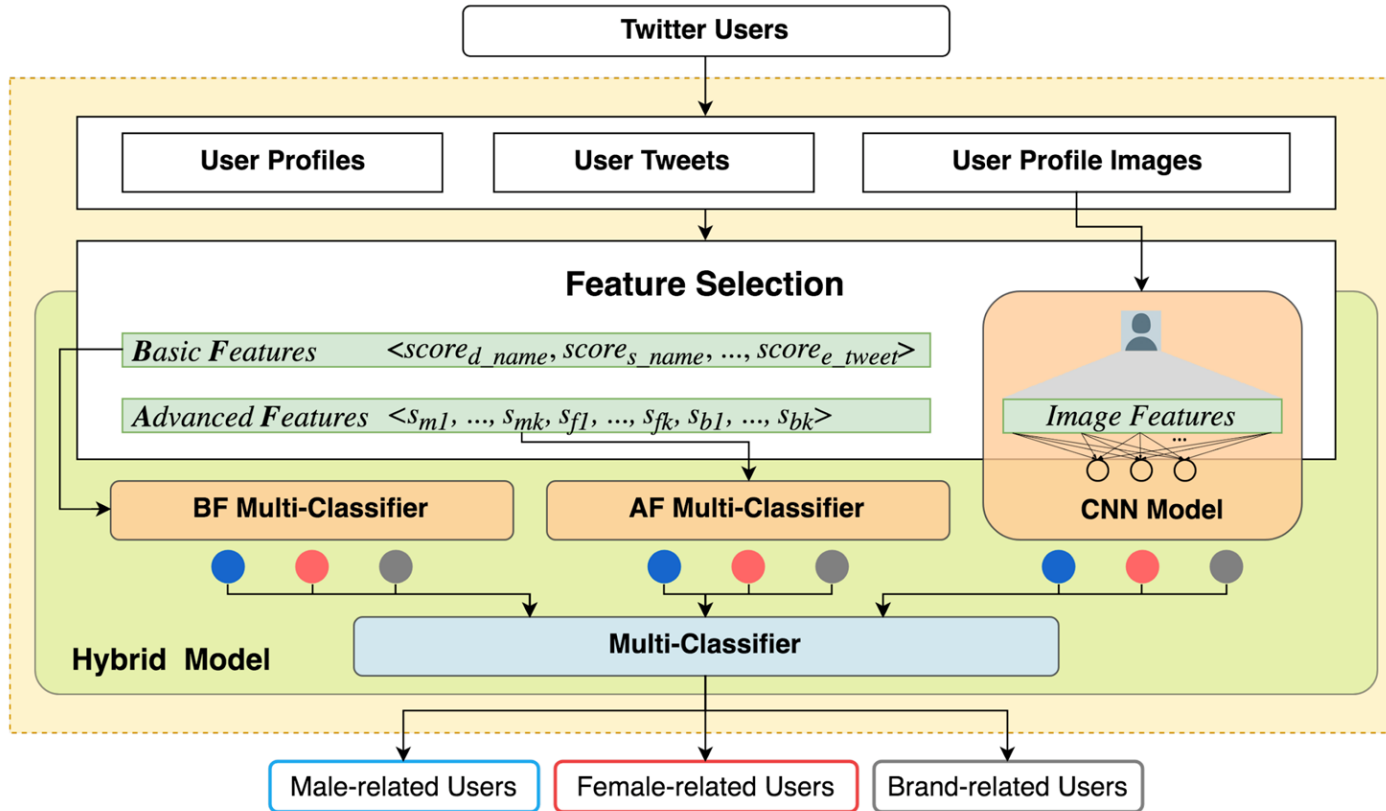


Project goal



Project Goals

- Create web interface for TwiRole
- Improve accuracy of Twirole



A visualization of the “hybrid” model. From the TwiRole research paper.



Development

Website

Client wanted something similar to Botometer, a Twitter classification web application.

Botometer[®]
An OSoMe project (bot•o•meter)






Botometer (formerly BotOrNot) checks the activity of a Twitter account and gives it a score based on how likely the account is to be a bot. Higher scores are more bot-like.

Use of this service requires Twitter authentication and permissions. ([Why?](#))

If something's not working or you have questions, please contact us only after reading the [FAQ](#).

Botometer is a joint project of the Network Science Institute ([UNI](#)) and the Center for Complex Networks and Systems Research ([CNetS](#)) at Indiana University.

▼  @CNN 

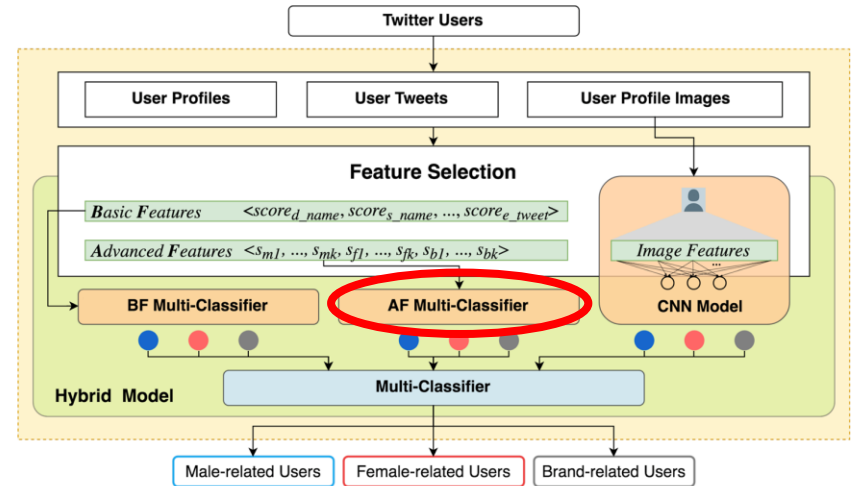
0.3 / 5 

English-specific features	Language-independent features	Bot score based on	
Content: 2.2	Friend: 0.8	All features: 0.3	
Sentiment: 0.8	Network: 1.0	Language-independent: 0.2	
	Temporal: 1.3	User profile language: en	
	User: 0.2	Complete Automation Probability: 0%	

[Profile](#) [Tweet](#) [Details](#) [Feedback](#)

k -top Emojis

- New feature in the advanced classifier
- Generates a vector of the most popular emojis for male, female, and brand
- Initial results look promising



```
training_male_screen_name = benchmark.screen_name[training_male_index]
training_female_screen_name = benchmark.screen_name[training_female_index]
training_brand_screen_name = benchmark.screen_name[training_brand_index]

ktop_emojis_dict = sc.get_ktop_emojis(training_male_screen_name,
                                     training_female_screen_name,
                                     training_brand_screen_name,
                                     'benchmark_1/tweets_clean', 10)
```

```
[(':+1:', 1304), (':fire:', 247), (':rofl:', 177), (':large_blue_circle:', 131), (':white_circle:', 126), (':punch:', 112), (':bear:', 103), (':squid:', 102), (':comet:', 99), (':man shrugging:', 96)]
```

```
[(':sob:', 16389), (':heart_eyes:', 14282), (':joy:', 10243), (':kissing_heart:', 7534), (':blush:', 4782), (':weary:', 4010), (':two_hearts:', 2884), (':purple_heart:', 2825), (':roll_eyes:', 2115), (':tada:', 1902)]
```

```
[(':rotating_light:', 114), (':point_right:', 99), (':spider:', 97), (':studio_microphone:', 76), (':rocket:', 76), (':minidisc:', 67), (':shopping:', 67), (':india:', 65), (':jp:', 41), (':tickets:', 36)]
```

As we can see, each class tends to use unique classes of emojis.

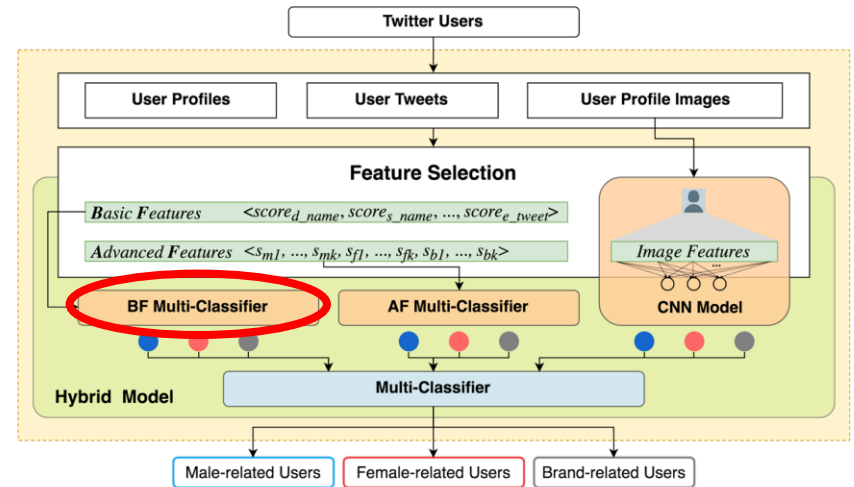


Emoji Frequency

- Created to test hypothesis that males, females, and brands use emojis differently
- Supported by an empirical observation of emoji usages
 - Females used 16,000+ of top emoji
 - Males used 1,200+

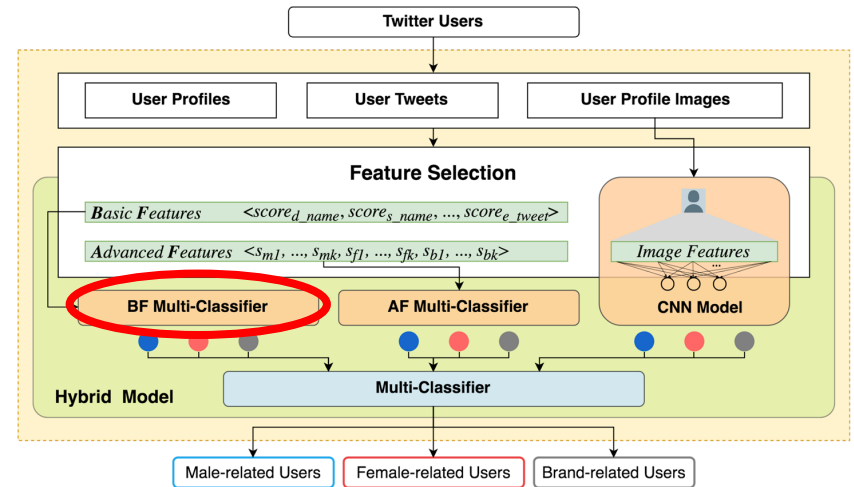
Second-person score

- Feature in the basic classifier
- Calculates a score based on the frequency of second-person terms (e.g. 'you', 'yours')



Third-person score

- Feature in the basic classifier
- Calculates a score based on the frequency of third-person terms (e.g. 'he', 'she', 'it', 'they')



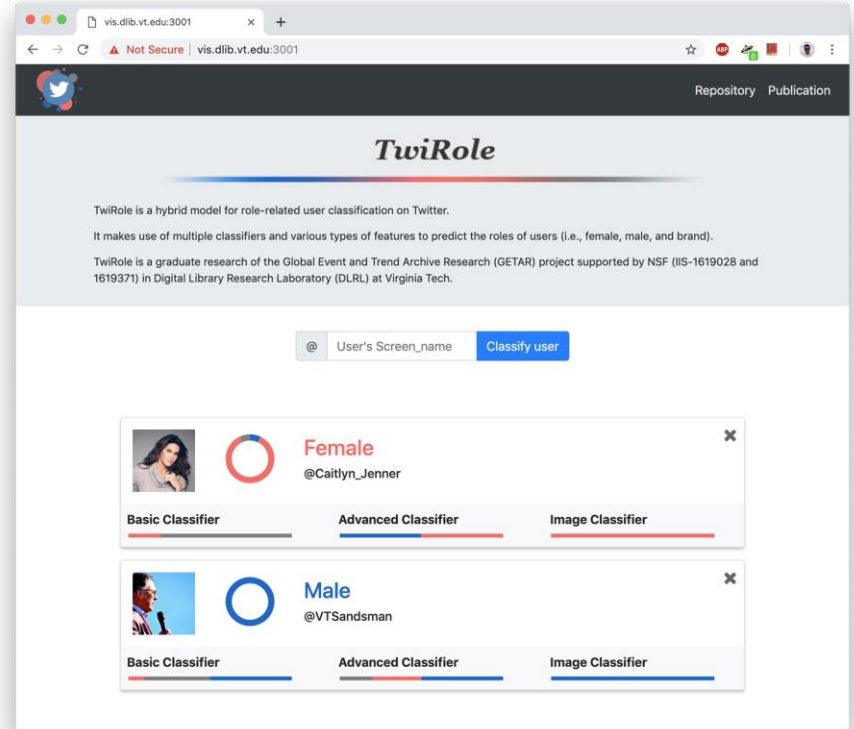


Results

Front end

The final website design. Our client is satisfied with the interface.

Live at <https://vis.dlib.vt.edu:3001>

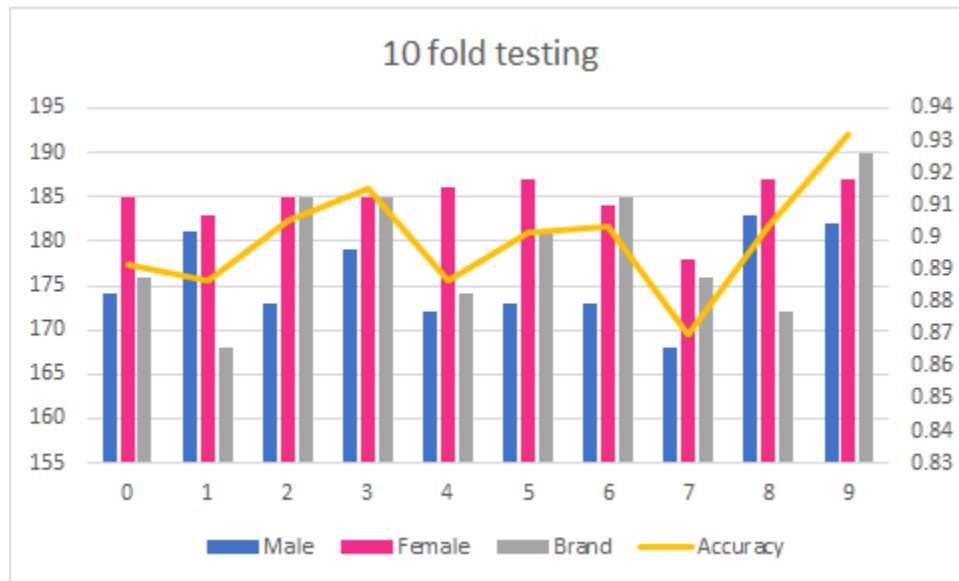




Results from running tests

Method	Accuracy
Baseline	89.72%
k-top emojis	89.95%
Second + third person scores	89.68%
k-top emojis + second + third person scores	89.75%
Emoji frequency score	89.62%

Model w/ k-top emojis





Model improvements

- k-top emojis seemed to yield the best improvement
- Training takes a long time, maybe some other combination of pre-existing features would result in a more accurate model

Testing/Evaluation



Testing

- Running the model and checking accuracy
 - Cross validation
- Failed to classify on tricky cases
 - Research-heavy tweeters
 - Transgendered users
- Extensive real-user front-end testing



User Evaluation

- Gave users task on how to use our website
- Users generally liked simplicity
- Many comments on how website incorrectly classifies some users
 - Unavoidable, function of the model accuracy



Demo

<https://vis.dlib.vt.edu:3001>

Acknowledgements



Acknowledgements

Paper - <https://arxiv.org/abs/1811.10202>

Github - <https://github.com/thebluebirds/TwiRole>

We would like to formally thank Liuqing Li, Dr. Edward A. Fox, and the Digital Library Research Laboratory.

We would like to thank the VT CS department and NSF for its support of the Global Event and

Trend Archive Research (GETAR) project through grants IIS-1619028 and 1619371