



DEMO Overview & Tutorial

18th International Conference on
Information Systems for Crisis Response and Management

***“Embracing the
Interdisciplinary Nature of
Crisis Management”***

Workshops and Doctoral Symposium - May 23rd, 2021

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Blacksburg, Virginia USA
Virginia Tech

<http://www.drrm.fralin.vt.edu/is cram2021/>

Program Committee co-chairs:

Anouck Adrot

Rob Grace

Kathleen Moore

(iscram2021@gmail.com)



TITLE

TwRole – A user classification tool for supporting user-centered analysis on Twitter

INTRODUCTION

Users in social media like Twitter exhibit particular behavior, and play different roles. According to previous research, male users prefer talking about technology and sports, while female users tend to show their emotions. A brand (i.e., newsmaker, institution, or organization), identified as neither male nor female, is likely to deliver messages, provide job offers, or publish advertisements. Discovering such different roles of users facilitates research and applications.

To aid a variety of studies regarding disaster-related collections, we propose TwRole, a hybrid model for role-related user classification on Twitter, which detects brand-related, female-related, and male-related users. TwRole utilizes features from tweets, user profiles, and profile images. It then applies a set of classifiers to identify a user's role. It outperforms existing methods; evaluation studies also show it obtains balanced results across the roles.

With the help of TwRole, we classify a large number of users from multiple collections curated from various types of disasters (e.g., hurricane, earthquake, school shooting). By combining other techniques (e.g., emotion detection, topic modeling), we conducted a set of analyses as a guidance to user-centered social research, leading to multiple interesting results, which have been published at a prior ISCRAM conference.

The TwRole tool was developed during Ph.D. research work funded by the Global Event and Trend Archive Research (GETAR) project, through NSF grant IIS-1619028.

Please mark if this is a: Poster Submission [] or a Demonstration submission [X]

POSTER SUBJECT (if applicable)

Provide an abstract of the content of the poster. If possible, please include the broader implications of the project.

[Add content here]

DEMONSTRATION SUBJECT (if applicable)

DEMO 1:

We demonstrate the use of TwiRole, through the web application we built to connect with our hybrid machine learning model. Everyone can access the website at <http://vis.dlib.vt.edu:3001>. The online user classification service handles a wide range of Twitter users, giving visual feedback that illustrates some of the inner workings of the classifiers.

The only input required from users is the screen name of a Twitter account. After crawling relevant information, the application shows the account's screenname, along with her/his/its profile image. The role prediction results of the three sub-modules are shown through stacked bar charts, while the final prediction result is presented through a donut chart; see Figure 1.

DEMO 2:

We demonstrate the reproducibility of our TwiRole technology and software. We published a compute capsule (<https://codeocean.com/capsule/9584745/tree/v4>) on Code Ocean; see Figure 2. The capsule contains not only the code, but everything else that the code needs in order to run, namely:

- 1) pre-trained classifiers;
- 2) three Twitter accounts' information for testing;
- 3) a specification of the computational environment, including the operating system, packages, and dependent libraries.

Our work has been verified to be computationally reproducible, generating the correct prediction results for the three Twitter users; see Figure 3.

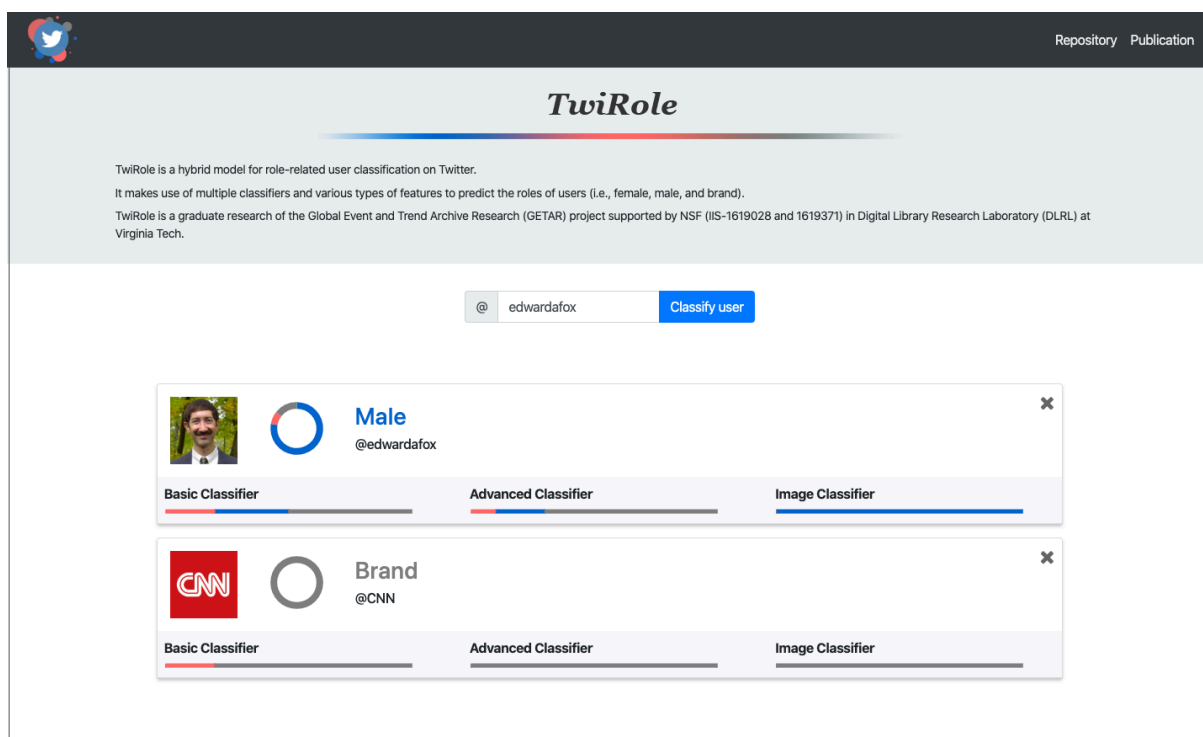


Figure 1. Online prediction results of two selected Twitter accounts

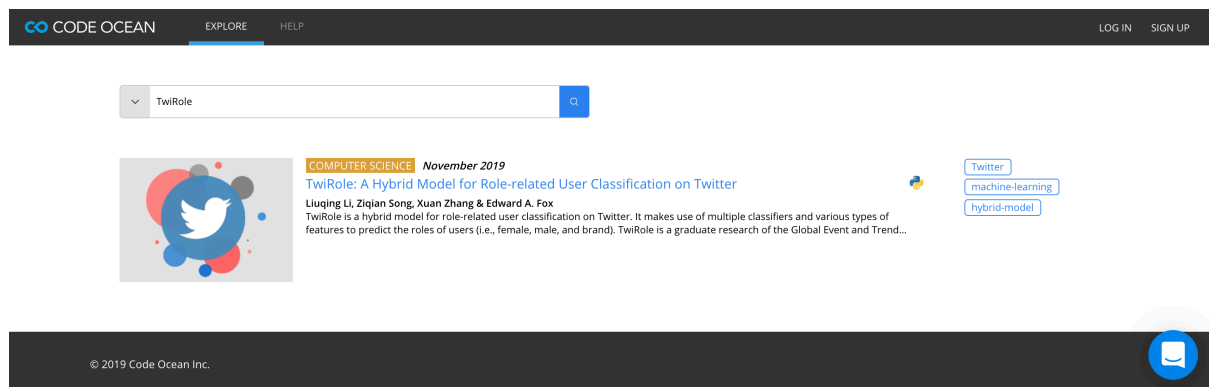


Figure 2. The capsule of TwiRole on Code Ocean

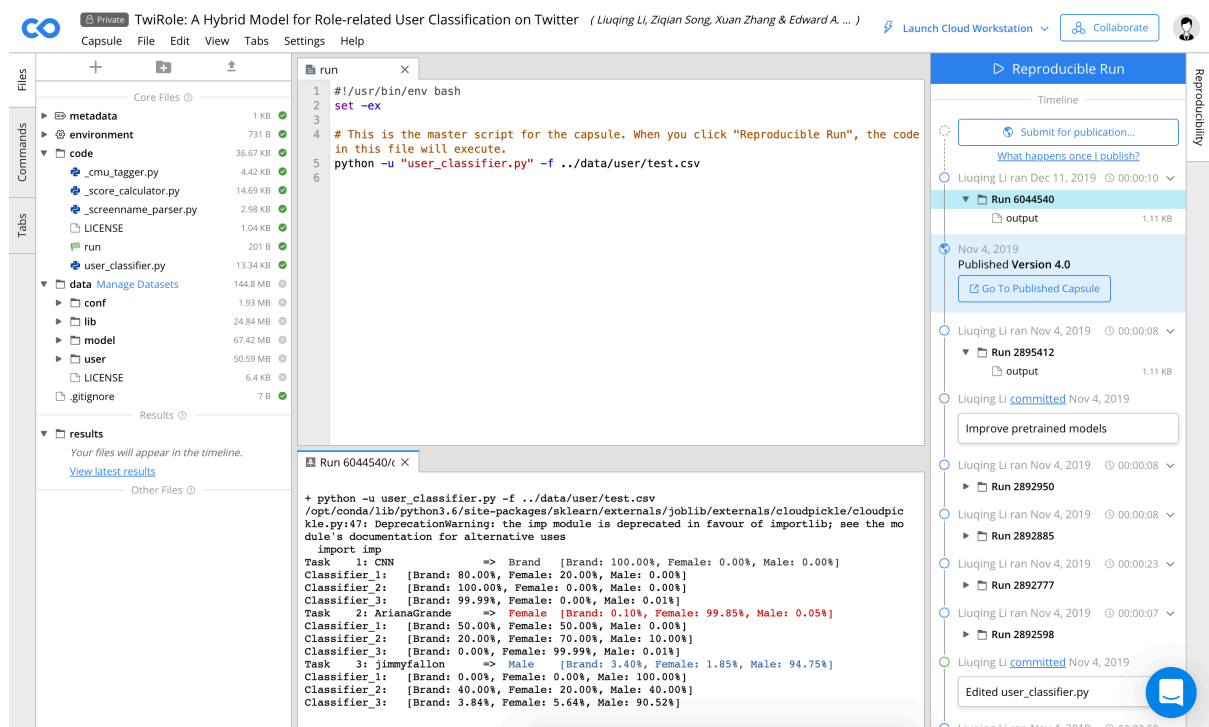


Figure 3. Three reproducible results predicted by TwiRole on Code Ocean

DEMO 3:

We demonstrate the sharing of our source code with pre-trained models on GitHub. This would allow researchers to engage in further deployment and development, so that they can adapt TwiRole to their specific research scenarios and applications.

Regarding the GitHub project (<https://github.com/liuqingli/TwiRole>), we describe how to install essential libraries, request Twitter credentials, and extend the configuration. We also present how to run single and multiple user classification tasks from the command line.

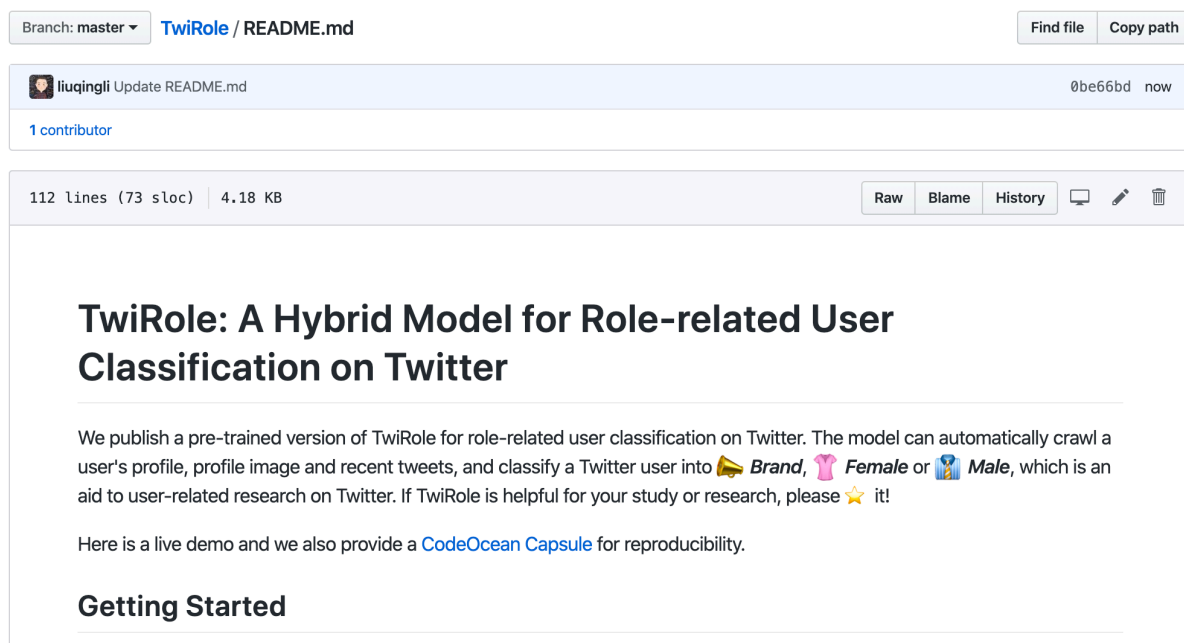




Figure 4 A screenshot of the GitHub page of TwiRole

PRESENTER INFORMATION

Edward Fox received his Ph.D. from Cornell in 1983, and then joined the faculty of Virginia Tech's Department of Computer Science. Having worked on ISCRAM-related topics since 2007, he has been co-author of ISCRAM conference/journal works in 2011, 2012, 2013, 2014, and 2019. His research and teaching includes digital libraries, Web archiving, information storage and retrieval, NLP/AI, and machine/deep learning.

Liuqing Li received his Ph.D. degree from Virginia Tech. Working as a GRA on the GETAR project, he focused on event/disaster-related collection understanding and services, including collection development, user classification, and event summarization. He published one paper at the ISCRAM 2019 conference and another ISCRAM paper has been accepted for 2020.

	<p>Author: Edward A. Fox (Presenter)</p> <p>Email: fox@vt.edu</p> <p>Organization: Virginia Tech</p>
	<p>Author: Liuqing Li</p> <p>Email: liuqing@vt.edu</p> <p>Organization: Virginia Tech, graduating from Ph.D. work in Spring 2020, and then moving to work at Verizon Media</p>

Tutorial for TwiRole Demo at ISCRAM 2021

DEMO 1:

Prerequisites: None

We demonstrate the use of TwiRole, through the web application we built to connect with our hybrid machine learning model. The online user classification service handles a wide range of Twitter users, giving visual feedback that illustrates some of the inner workings of the classifiers.

Everyone can access the website at:

<http://tml.cs.vt.edu:3001>

The only input is a Twitter account's **screenname** (xyz in @xyz).

Some examples include *CNN*, *edwardafox*, *Virginia_Tech*, *ABC*, etc.

DEMO 2:

Prerequisites:

1. An active account on [Code Ocean](#)
2. Docker on your local machine

How to get our capsules?

Search the “twirole” capsule on the Code Ocean explore [page](#).

How to run TwiRole on Code Ocean?

Click the “Reproducible Run” button to check outputs. Meanwhile, the entire capsule will be copied into your own dashboard.

NOTE

1. TwiRole will detect three users by default: *CNN*, *ArianaGrande*, and *jimmyfallon*.
2. If you are not familiar with Code Ocean or our codes, we strongly recommend you **NOT** to run the codes with customization on Code Ocean.

How to run TwiRole on your local machine?

1. Go to Menu -> “Capsule -> Export” and click “Include data” to export capsules (zip files).
2. Unzip the capsule files. Open REPRODUCING.md in an editor, e.g., TextEdit, and follow the instructions therein to build a Docker environment.
3. Run the “docker run ...” command in REPRODUCING.md to regenerate the same results on your local machine.

PROBLEM
Error: docker: Error response from daemon: OCI runtime create failed: container_linux.go:367: starting container process caused: exec: "./run": permission denied: unknown."
SOLUTION
Grant execute permission on run.sh -> chmod u+x code/run Then run again the "docker run ..." command

How to customize our tools on your local machine?

1. It is recommended that you contact Liuqing Li about this if you are unfamiliar with Twitter credentials, running Python programs, using NLTK, etc.
2. Customization could involve employing NLTK, which can be done by un-commenting lines 26 and 27 in user_classifier.py to enable the NLTK downloading process.
3. If you are going to use TwiRole beyond a trial test, you need to request Twitter credentials from <https://developer.twitter.com/en/apps> and then replace the placeholders at line 47-50 in user_classifier.py.

DEMO 3: For advanced users, who may want to consult Liuqing Li first :

Prerequisites:

1. Anaconda (Python=3.6, virtual environment)

How to run TwiRole in a virtual environment in Anaconda?

1. Create and activate a virtual environment

```
conda create -n py36 python=3.6 anaconda
conda activate py36
```

1. Clone the GitHub [repo](#) on your local machine:

```
git clone https://github.com/liuqingli/TwiRole.git
```

2. Install essential libraries:

```
cd TwiRole
pip install -r requirements.txt
```