

2017

Identifying Depressive Disorder in the Twitter Population

Goonmeet Bajaj

Wright State University - Main Campus, bajaj.3@wright.edu

Amir Hossein Yazdavar


Krishnaprasad Thirunarayan

Wright State University - Main Campus, t.k.prasad@wright.edu

Amit Sheth

Wright State University - Main Campus, amit.sheth@wright.edu

Follow this and additional works at: <https://corescholar.libraries.wright.edu/knoesis>

 Part of the [Bioinformatics Commons](#), [Communication Technology and New Media Commons](#), [Databases and Information Systems Commons](#), [OS and Networks Commons](#), and the [Science and Technology Studies Commons](#)

Repository Citation

Bajaj, G., Yazdavar, A. H., Thirunarayan, K., & Sheth, A. (2017). Identifying Depressive Disorder in the Twitter Population. .
<https://corescholar.libraries.wright.edu/knoesis/1140>

This Article is brought to you for free and open access by the The Ohio Center of Excellence in Knowledge-Enabled Computing (Kno.e.sis) at CORE Scholar. It has been accepted for inclusion in Kno.e.sis Publications by an authorized administrator of CORE Scholar. For more information, please contact corescholar@www.libraries.wright.edu, library-corescholar@wright.edu.

Identifying Depressive Disorder in the Twitter Population

Goonmeet Bajaj, Amir Hossein Yazdavar, T.K. Prasad, Amit Sheth

Kno.e.sis Center, Wright State University, Dayton, OH



Overview

Depression is a highly prevalent **public health challenge** and a major cause of disability across the globe.

- Annually **6.7%** of Americans (that is, more than **16 million**)¹
- Traditional approaches to curb depression involve survey-based methods via phone or online questionnaires
 - Large temporal gaps and cognitive bias

Social media **provides a method** for learning users' feelings, emotions, behaviors, and decisions in real-time.

- How well do tweets express depressive behavior and can they be detected automatically?
- How well does geographical information serve as the basis for effective community-level management of depression and location of mental health services?

Dataset



*Users judged depressed by human annotators

Self Reported Users



- Profiles collected using the **Social-media Depression Detector (SDD)**²
- SDD is based on **PHQ-9** – a multipurpose instrument for screening, diagnosing, monitoring, and measuring the severity of depression.

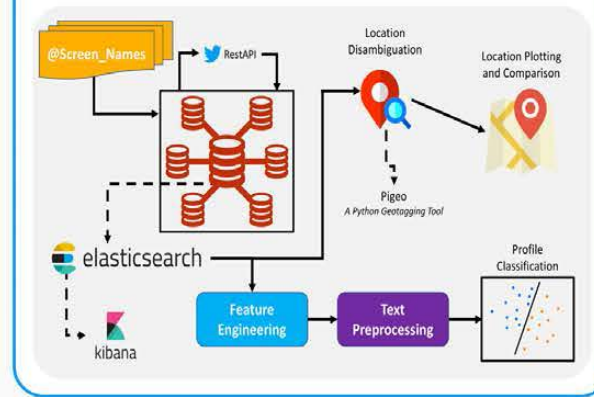
The Patient Health Questionnaire (PHQ-9)

Patient Name _____ Date of Visit _____

Over the past 2 weeks, how often have you been bothered by any of the following problems?

	Not At all	Several Days	More Than Half the Days	Nearly Every Day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed or hopeless	0	1	2	3
3. Trouble falling asleep, staying asleep, or sleeping too much	0	1	2	3

System Architecture



Feature Engineering

Prediction model:

- Automatically detect depressed users leveraging a multimodal feature set:
 - # of tweets
 - # of followers
 - # of friends
 - tweet content
 - Levenshtein distance between screen name and lexicon of depressive symptoms
 - text from image
 - emotion from images
 - tweeting time
 - ego-network



Geographical Analysis

Map of hospital inpatient and outpatient mental health centers from the **Substance Abuse and Mental Health Services Administration (SAMHSA)**



Map of user profiles collected by our platform



Map Key:

- Red pointer = users with geo-enabled tweets
- Green pointer = users with places or locations in tweets or profile
- Teal pointer = location determined by *Pigeo*, A Python Geotagging Tool

Brainstorm

Please tell me your interest and your thoughts about this study!

- What are possible features that used to classifying profiles?

Email me @ goonmeet.bajaj@gmail.com

Project website: rebrand.ly/depressionProject



References: [1] <http://bit.ly/2okBKny>, [2] Yazdavar, Amir Hossein, et al. "Semi-Supervised Approach to Monitoring Clinical Depressive Symptoms in Social Media."



Project Funded by:
NIH R01 Grant #: MH105384-01A1

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.