ACL 2019

Social Media Mining for Health Applications (#SMM4H) Workshop & Shared Task

Proceedings of the Fourth Workshop

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Association for Computational Linguistics (ACL)
209 N. Eighth Street
Stroudsburg, PA 18360
USA
Tel: +1-570-476-8006
Fax: +1-570-476-0860
acl@aclweb.org

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Preface

Welcome to the 4^{th} Social Media Mining for Health Applications Workshop and Shared Task - #SMM4H 2019.

The total number of users of social media continues to grow worldwide, resulting in the generation of vast amounts of data. Popular social networking sites such as Facebook, Twitter and Instagram dominate this sphere. According to estimates, 500 million tweets and 4.3 billion Facebook messages are posted every day [1]. The latest Pew Research Report [2], nearly half of adults worldwide and two-thirds of all American adults (65%) use social networking. The report states that of the total users, 26% have discussed health information, and, of those, 30% changed behavior based on this information and 42% discussed current medical conditions. Advances in automated data processing, machine learning and NLP present the possibility of utilizing this massive data source for biomedical and public health applications, if researchers address the methodological challenges unique to this media.

In its fourth iteration, the #SMM4H workshop takes place in Florence, Italy, on August 2, 2019, and is co-located with the annual meeting of the Association of Computational Linguistic (ACL). Following on the success of our Workshops and accompanying shared tasks on the topic that were hosted at the Pacific Symposium in Biocomputing (PSB) in 2016, at the AMIA Annual Conference in 2017, and at the EMNLP conference in 2018, this workshop aims to provide a forum for the ACL community members to present and discuss NLP advances specific to social media use in the particularly challenging area of health applications, with a special focus given to automatic methods for the collection, extraction, representation, analysis, and validation of social media data for health informatics.

We received very high quality submissions for the workshop and selected only 8 articles for long presentations (Workshop Acceptance Rate: 54%) and 17 for short talks or posters presentations. As for the previous years, we ran in parallel to the workshop a shared task with a particular interest on social media mining for pharmacovigilance. For this fourth execution of the #SMM4H shared tasks, we challenged the community with two different problems involving annotated user posts from Twitter (tweets). The first problem focuses on performing pharmacovigilance from social media data during a series of three subtasks inviting the participants to extract and normalize tweets mentioning adverse effects of drugs. The second problem explores the generalizability of predictive models through a task of automatic classification of tweets with personal health experience mentions in multiple contexts. With a total of 34 teams registered and 19 teams having submitted a run, we confirm a growing interest of the community for health mining in social media data.

This year, we standardized the submission process during the shared task using the web platform Codalab[3]. We believed this helped improved the reproducibility of the experiments. Acting as a central hub, the data are easily distributed to the research community at large and, as the Codalab website remains active even after the competition, new teams can upload their submissions and be automatically evaluated to compare their results with the official results of the challenge.

Next year, we will go further to improve reproducibility by allowing participants to upload their code and models directly in Codalab for evaluation, a change which will guarantee a fair competition and the dissemination of the technical characteristics of the systems. Another important change this year that will impact future iterations of the workshop is an open call to the community for shared task proposals, ensuring that our workshop continues to address the main problems and challenges in this growing field

[1] Team Gwava. "How Much Data is Created on the Internet each Day?" 2016, Available online at `https://www.gwava.com/blog/internet-data-created-daily`. [Accessed: 03-Jan-2017].

[2] Pew Research Center. "Social Media Fact Sheet". 2017. Available online at `http://www.pewinternet.org/fact-sheet/social-media/`. [Accessed: 03-Mar-2017].

[3] CodaLab is free and open-source, available at `https://competitions.codalab.org/`.

of health mining for social media.

The organizing committee would like to thank the program committee, consisting of 13 researchers, for their thoughtful input on the submissions, as well as the organizers of the ACL for their support and management. Finally, a huge thanks to all authors who submitted a paper to the workshop or participated in the shared tasks; this workshop would not have been possible without them and their hard work.

Graciela, Davy, Abeed, Arjun, Ashlynn, Michael

Organizing Committee:

Graciela Gonzalez-Hernandez, University of Pennsylvania
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Table of Contents

Extracting Kinship from Obituary to Enhance Electronic Health Records for Genetic Research
Kai He, Jialun Wu, Xiaoyong Ma, Chong Zhang, Ming Huang, Chen Li and Lixia Yao 1

Lexical Normalization of User-Generated Medical Text
Anne Dirkson, Suzan Verberne and Wessel Kraaij 11

Overview of the Fourth Social Media Mining for Health (SMM4H) Shared Tasks at ACL 2019
Davy Weissenbacher, Abeed Sarker, Arjun Magge, Ashlynn Daughton, Karen O'Connor, Michael J. Paul and Graciela Gonzalez-Hernandez 21

MedNorm: A Corpus and Embeddings for Cross-terminology Medical Concept Normalisation
Maksim Belousov, William G. Dixon and Goran Nenadic 31

Passive Diagnosis Incorporating the PHQ-4 for Depression and Anxiety
Fionn Delahunty, Robert Johansson and Mihael Arcan 40

HITSZ-ICRC: A Report for SMM4H Shared Task 2019-Automatic Classification and Extraction of Adverse Effect Mentions in Tweets
Shuai Chen, Yuanhang Huang, Xiaowei Huang, Haoming Qin, Jun Yan and Buzhou Tang 47

KFU NLP Team at SMM4H 2019 Tasks: Want to Extract Adverse Drugs Reactions from Tweets? BERT to The Rescue
Zulfat Miftahutdinov, Ilseyar Alimova and Elena Tutubalina 52

Approaching SMM4H with Merged Models and Multi-task Learning
Tilia Ellendorff, Lenz Furrer, Nicola Colic, Noëmi Aepli and Fabio Rinaldi 58

Identifying Adverse Drug Events Mentions in Tweets Using Attentive, Collocated, and Aggregated Medical Representation
Xinyan Zhao, Deahan Yu and V.G.Vinod Vydiswaran 62

Correlating Twitter Language with Community-Level Health Outcomes
Arno Schneuwly, Ralf Grubenmann, Séverine Rion Logean, Mark Cieliebak and Martin Jaggi . . 71

Affective Behaviour Analysis of On-line User Interactions: Are On-line Support Groups More Therapeutic than Twitter?
Giuliano Tortoreto, Evgeny Stepanov, Alessandra Cervone, Mateusz Dubiel and Giuseppe Riccardi 79

Transfer Learning for Health-related Twitter Data
Anne Dirkson and Suzan Verberne 89

NLP@UNED at SMM4H 2019: Neural Networks Applied to Automatic Classifications of Adverse Effects Mentions in Tweets
Javier Cortes-Tejada, Juan Martinez-Romo and Lourdes Araujo 93

Detecting and Extracting of Adverse Drug Reaction Mentioning Tweets with Multi-Head Self Attention
Suyu Ge, Tao Qi, Chuhan Wu and Yongfeng Huang 96

Deep Learning for Identification of Adverse Effect Mentions In Twitter Data
Paul Barry and Ozlem Uzuner 99

Using Machine Learning and Deep Learning Methods to Find Mentions of Adverse Drug Reactions in Social Media
Pilar López Úbeda, Manuel Carlos Díaz Galiano, Maite Martin and L. Alfonso Urena Lopez . . 102

Towards Text Processing Pipelines to Identify Adverse Drug Events-related Tweets: University of Michigan @ SMM4H 2019 Task 1
V.G.Vinod Vydiswaran, Grace Ganzel, Bryan Romas, Deahan Yu, Amy Austin, Neha Bhomia, Socheatha Chan, Stephanie Hall, Van Le, Aaron Miller, Olawunmi Oduyebo, Aulia Song, Radhika Sondhi, Danny Teng, Hao Tseng, Kim Vuong and Stephanie Zimmerman 107

Neural Network to Identify Personal Health Experience Mention in Tweets Using BioBERT Embeddings
Shubham Gondane 110

Give It a Shot: Few-shot Learning to Normalize ADR Mentions in Social Media Posts
Emmanouil Manousogiannis, Sepideh Mesbah, Alessandro Bozzon, Selene Baez and Robert Jan Sips 114

BIGODM System in the Social Media Mining for Health Applications Shared Task 2019
Chen-Kai Wang, Hong-Jie Dai and Bo-Hung Wang 117

Detection of Adverse Drug Reaction Mentions in Tweets Using ELMo
Sarah Sarabadani 120

Adverse Drug Effect and Personalized Health Mentions, CLaC at SMM4H 2019, Tasks 1 and 4
Parsa Bagherzadeh, Nadia Sheikh and Sabine Bergler 123

MIDAS@SMM4H-2019: Identifying Adverse Drug Reactions and Personal Health Experience Mentions from Twitter
Debanjan Mahata, Sarthak Anand, Haimin Zhang, Simra Shahid, Laiba Mehnaz, Yaman Kumar and Rajiv Ratn Shah 127

Detection of Adverse Drug Reaction in Tweets Using a Combination of Heterogeneous Word Embeddings
Segun Taofeek Aroyehun and Alexander Gelbukh 133

Identification of Adverse Drug Reaction Mentions in Tweets – SMM4H Shared Task 2019
Samarth Rawal, Siddharth Rawal, Saadat Anwar and Chitta Baral 136

Conference Program

Friday, August 2, 2019

9:00–9:10 *Introduction*
Graciela Gonzalez-Hernandez

9:10–9:30 *Extracting Kinship from Obituary to Enhance Electronic Health Records for Genetic Research*
Kai He, Jialun Wu, Xiaoyong Ma, Chong Zhang, Ming Huang, Chen Li and Lixia Yao

9:30–9:50 *Lexical Normalization of User-Generated Medical Text*
Anne Dirkson, Suzan Verberne and Wessel Kraaij

9:50–10:10 *Overview of the Fourth Social Media Mining for Health (SMM4H) Shared Tasks at ACL 2019*
Davy Weissenbacher, Abeed Sarker, Arjun Magge, Ashlynn Daughton, Karen O'Connor, Michael J. Paul and Graciela Gonzalez-Hernandez

10:30–11:30 ***Coffee Break and Poster Session***

11:30–11:50 *MedNorm: A Corpus and Embeddings for Cross-terminology Medical Concept Normalisation*
Maksim Belousov, William G. Dixon and Goran Nenadic

11:50–12:00 *Passive Diagnosis Incorporating the PHQ-4 for Depression and Anxiety*
Fionn Delahunty, Robert Johansson and Mihael Arcan

12:00–14:00 ***Lunch***

14:00–14:20 *HITSZ-ICRC: A Report for SMM4H Shared Task 2019-Automatic Classification and Extraction of Adverse Effect Mentions in Tweets*
Shuai Chen, Yuanhang Huang, Xiaowei Huang, Haoming Qin, Jun Yan and Buzhou Tang

14:20–14:40 *KFU NLP Team at SMM4H 2019 Tasks: Want to Extract Adverse Drugs Reactions from Tweets? BERT to The Rescue*
Zulfat Miftahutdinov, Ilseyar Alimova and Elena Tutubalina

14:40–15:00 *Approaching SMM4H with Merged Models and Multi-task Learning*
Tilia Ellendorff, Lenz Furrer, Nicola Colic, Noëmi Aepli and Fabio Rinaldi

15:00–16:00 ***Coffee Break and Poster Session***

Friday, August 2, 2019 (continued)

16:00–16:20 *Identifying Adverse Drug Events Mentions in Tweets Using Attentive, Collocated, and Aggregated Medical Representation*
Xinyan Zhao, Deahan Yu and V.G.Vinod Vydiswaran

16:20–16:40 *Correlating Twitter Language with Community-Level Health Outcomes*
Arno Schneuwly, Ralf Grubenmann, Séverine Rion Logean, Mark Cieliebak and Martin Jaggi

16:40–16:50 *Affective Behaviour Analysis of On-line User Interactions: Are On-line Support Groups More Therapeutic than Twitter?*
Giuliano Tortoreto, Evgeny Stepanov, Alessandra Cervone, Mateusz Dubiel and Giuseppe Riccardi

17:00–17:30 ***Discussion and Conclusion***

Poster Sessions

Transfer Learning for Health-related Twitter Data
Anne Dirkson and Suzan Verberne

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Friday, August 2, 2019 (continued)

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