

Introduction to this Special Issue: Modeling and Understanding the Spread of COVID-19 (Part I)

Andreas Züfle

Department of Geography and Geoinformation Science, George Mason University

Email: azufle@gmu.edu

The spread of the coronavirus disease 2019 (COVID-19) has affected all of us. Across the globe researchers investigate how to model and understand the spread of COVID-19, to inform and educate about the science of virus transmission and prevention, and to encourage the development of processes and actions to address this global challenge. For this purpose, the SIGSPATIAL community is in a unique position, given our experience in managing, modeling, querying, and mining spatial and spatio-temporal data for nearly three decades. Many new research projects related to COVID-19 have been started in the last months, supported, for example, by NSF¹, NSERC Canada², and the German DFG³, and new COVID-19 funding opportunities are emerging almost daily.

The goal of this newsletter special issue is to rapidly disseminate current research efforts by the SIGSPATIAL community and to facilitate discussions and collaboration

This newsletter has three sections. The first section presents the event report of the ACM SIGSPATIAL 2019 conference held in Chicago, Illinois, USA, November 5th-8th 2019. Special thanks to the program chairs and general chairs for compiling this report for this newsletter.

The second section presents four exciting research articles related to COVID-19:

1. the first article by Umair Qazi et al. provides a very large dataset of hundreds of millions of multilingual COVID-19 Tweets with location information to enable data-driven research on how societies are collectively coping with this unprecedented global crisis,
2. the second article by Song Gao et al. presents an interactive web-based mapping platform that provides timely quantitative information on how people in different counties and states reacted to social distancing guidelines,
3. in the third article Alexander Hohl et al. describe their approach for rapid detection of COVID-19 clusters showing that hot spots of COVID-19 can be found in every major region in the U.S.,
4. in the fourth article, Zipei Fan et al. propose an epidemic simulation platform that uses real-world trajectory data to simulate transmissions, to identify possible contacts at risk, and to evaluate mitigation policies.

¹See the NSF Dear Colleague Letter on the Coronavirus Disease 2019 (COVID-19) <https://www.nsf.gov/pubs/2020/nsf20052/nsf20052.jsp>

²See the NSERC Alliance COVID-19 grants https://www.nserc-crsng.gc.ca/Innovate-Innover/COVID-19/index_eng.asp

³See the DFG Call for Multidisciplinary Research into Epidemics and Pandemics in Response to the Outbreak of SARS-CoV-2. https://www.dfg.de/en/research_funding/announcements_proposals/2020/info_wissenschaft_2020/index.html

In addition to these COVID-19 related articles, the third section section of this newsletter highlights two articles that are highly relevant to the SIGSPATIAL community although not directly related to COVID-19:

1. the fifth article by Amr Magdy provides a broad survey on managing and analyzing microblog data, including applications such as geotagging, event detection, and user analysis.
2. the sixth article by Kim et al. presents a realistic simulation framework to generate large scale temporal location-base social network and disease spread data sets that are made available to the broad community,

I hope this newsletter will help disseminate the great work our community is doing to fight and mitigate COVID-19. I'm convinced that the datasets presented in this issue will enable exciting research across the SIGSPATIAL community and beyond,

If you are working on a COVID-19 related project, or if you have exciting news, visions, or challenges that would be of broad interest to the SIGSPATIAL community, COVID-19 related or not, please reach out to me!

Finally, I want to cordially thank all the authors for their excellent contributions to this issue.