



# An In-depth Review of Privacy Concerns Raised by the COVID-19 Pandemic

Jiaqi Wang  
Penn State University  
02/2021

# Contents

- 1/ Human Online Activities in the COVID-19
- 2/ Increasing Privacy Threats due to the COVID-19 Pandemic
- 3/ Post-pandemic Potential Privacy Risks
- 4/ Potential Research about Pandemic-related Privacy Issues on Social Media

# Human Online Activities in the COVID-19

COVID-19  $\implies$  Quarantine  $\implies$  More interactions online



Usage increased 40% [1]



Usage increased 37% [1]



Usage increased 58% [1]

- Compared with interactions in the real world, self-disclosure information can more easily be propagated, searched, saved, and even processed on social media.
- The pandemic is changing people's sensitivity and attitude to privacy including what and how personal information can be disclosed [2]
- Presidential election - political stand, location, family relative
- Advanced data mining/machine learning across multiple social network platforms

# Increasing Privacy Threats due to the COVID-19 Pandemic - Mass Surveillance

---

- Personal data: location, body temperature, facial information, etc.
  - Cellphone, traffic cameras, and other sensors
  - Track human mobility, identify individuals with risk, and monitor the disease spread
  - Examples:
    - United Kingdom and India: smart city infrastructure has been reused to monitor the people's social distance
    - China: cell phone application
    - United States: Apple and Google provided a contact tracing application for their mobile users as well with bluetooth specification [4] and cryptography specification [5]
  - However, as a key part of the extension of the surveillance state, researchers stated that the anonymized data **is not always anonymous** and **location data can exacerbate inequality**.
-

## Increasing Privacy Threats due to the COVID-19 - Data Usage across Multiple Platforms

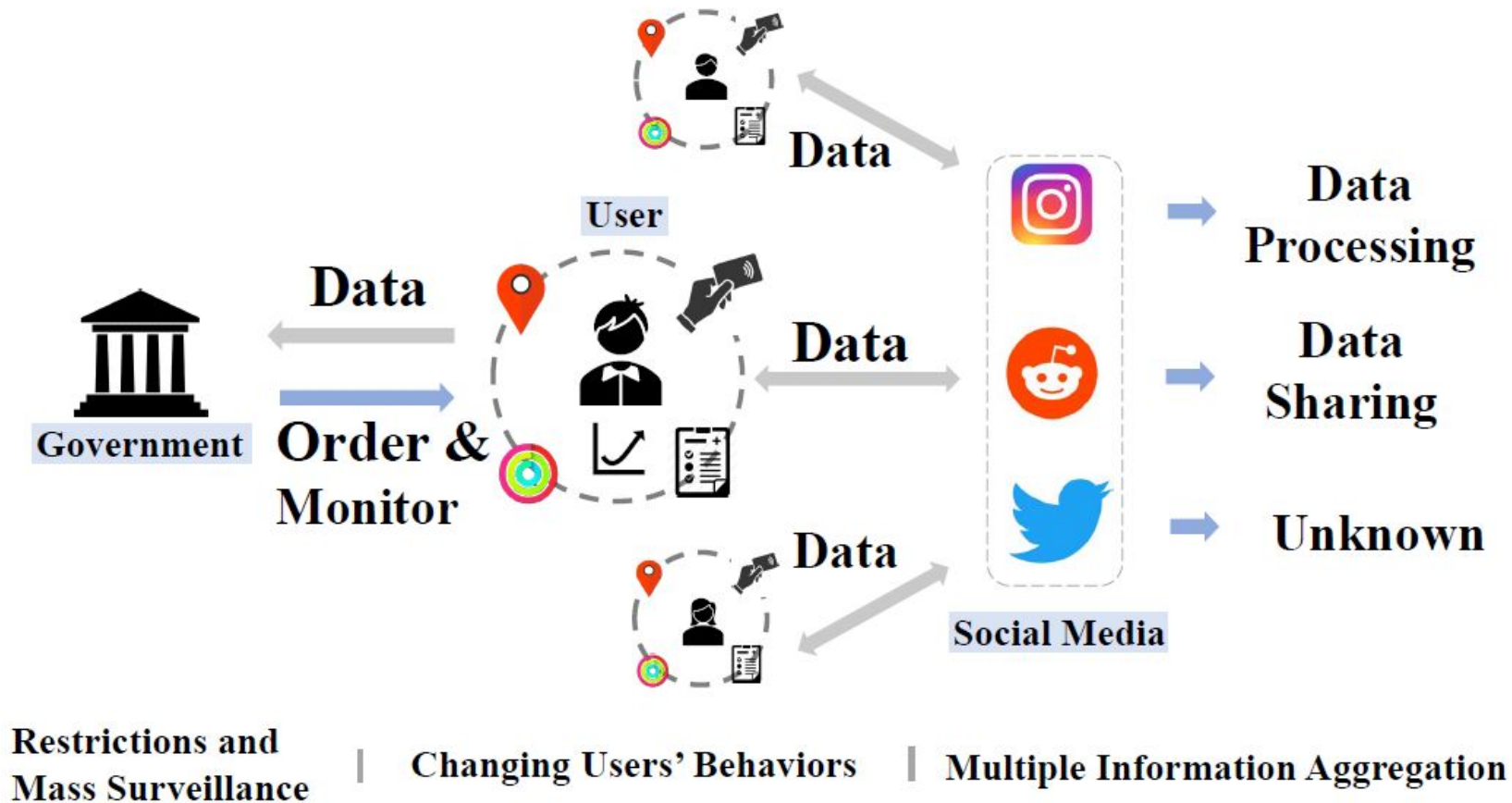
- A lot of released open dataset related to COVID-19 [7][8][9][10]
- More digit records and accounts are being created, such as social media and online shopping accounts
- How to measure privacy disclosure score based on the information across multiple social networks has been discussed extensively [11].
- Zola et al. explored a cross-source cross-domain sentiment analysis with training data from Amazon and Tripadvisor and testing on the data from Facebook and Twitter [12].

## Increasing Privacy Threats due to the COVID-19 - Change of Individual Privacy Calculus

---

- Another observed phenomenon and potential concern is the change of individuals' perception to self-disclosure and privacy.
  - People would more easily sacrifice their private health status information to get suggestions, pre-diagnosis, or contribute to what the government appeals during the COVID-19 pandemic [13].
  - Governments and companies provide convenient tools for people to update their personal information and implicitly convince people that the behaviors are a contribution to the public good [14].
  - However, to my best knowledge, there are not enough official files to remind people about individual privacy issues or broadcast basic knowledge of data usage for people during the COVID pandemic.
-

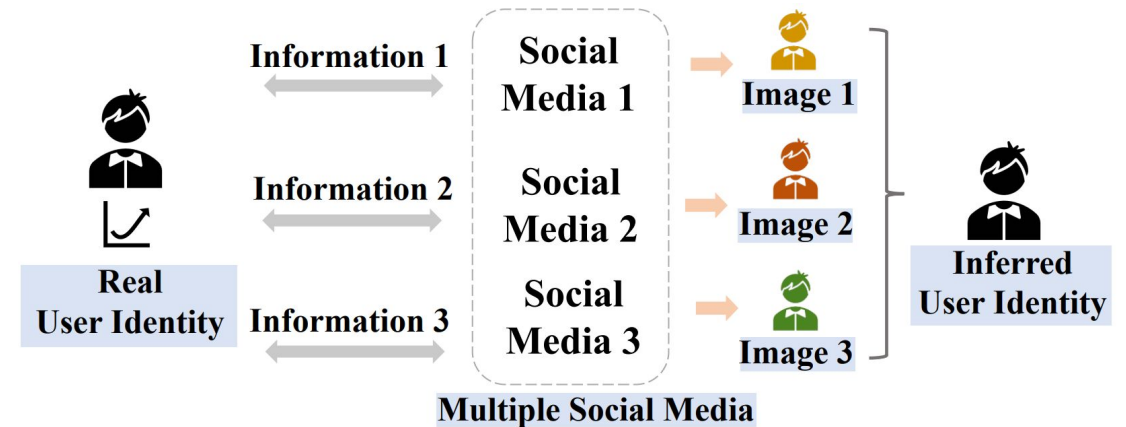
# A Systematic Overview



# Post-pandemic Potential Privacy Risks - Over-collected Data Abuse

## Over-collected Data Abuse

- The COVID-19 pandemic has promoted the development of e-commerce, online education, social media platforms, smart phone applications, and related virtual service.
- The governments could leverage contact tracing information to monitor and analyze citizens' behaviors, e.g. LGBT people identification in South Korea [15].
- User identity inference based on multiple social media.





## Post-pandemic Potential Privacy Risks - Public Privacy Concern and Social Trustworthiness

- As the COVID-19 pandemic carries on, debates and laws surrounding surveillance capabilities are at the forefront of many mind
- There is a great possibility that the government will not delete the collected personal data or even continue collecting the data without informing users. Another survey result in [16] shows that 69% U.S. adults thought they should have the right to have the medical data permanently deleted after necessary and legal usage
- Kye and Hwang [17] argued that the government actions do have a huge impact on social trust and government Trustworthiness. The temporal over-disclosed data and privacy data disclosure is gradually causing a stronger public privacy concern and challenging the government social trust.

# Potential Research about Pandemic-related Privacy Issues on Social Media

---

- Self-disclosure Interaction and Propagation
  - Public Privacy Concern and Attitude Tracing
  - Mental Health in the COVID-19 Pandemic
  - Prevention, Prediction, and Protection
-

# References

- [1] Kanter. 2020. COVID-19 Barometer: Consumer attitudes, media habits and expectations. URL <https://www.kantar.com/Inspiration/Coronavirus/COVID-19-Barometer-Consumer-attitudes-media-habits-andexpectations>
- [2] Naby-Grover, T.; Cheung, C. M.; and Thatcher, J. B. 2020. Inside out and outside in: How the COVID-19 pandemic affects self-disclosure on social media. *International Journal of Information Management* 55: 102188.
- [3] Hussein, M. R.; Shams, A. B.; Apu, E. H.; Mamun, K. A. A.; and Rahman, M. S. 2020. Digital Surveillance Systems for Tracing COVID-19: Privacy and Security Challenges with Recommendations. *arXiv preprint arXiv:2007.13182*
- [4] Apple; and Google. 2020a. Contact Tracing Bluetooth Specification. URL <https://www.blog.google/documents/58/> Contact Tracing - Bluetooth Specification v1.1 RYGZbKW.pdf
- [5] Apple; and Google. 2020b. Contact Tracing Cryptography Specification. URL <https://www.blog.google/documents/56/> Contact Tracing - Cryptography Specification.pdf
- [6] Frith, J.; and Saker, M. 2020. It Is All About Location: Smartphones and Tracking the Spread of COVID-19. *Social Media+ Society* 6(3): 2056305120948257
- [7] Blose, T.; Umar, P.; Squicciarini, A.; and Rajtmajer, S. 2020. Privacy in Crisis: A study of self-disclosure during the Coronavirus pandemic. *arXiv preprint arXiv:2004.09717*
- [8] Chen, E.; Lerman, K.; and Ferrara, E. 2020. Covid-19: The first public coronavirus twitter dataset. *arXiv preprint arXiv:2003.07372*
- [9] Pepe, E.; Bajardi, P.; Gauvin, L.; Privitera, F.; Lake, B.; Cattuto, C.; and Tizzoni, M. 2020. COVID-19 outbreak response,a dataset to assess mobility changes in Italy following national lockdown. *Scientific data* 7(1): 1–7
- [10] Cohen, J. P.; Morrison, P.; Dao, L.; Roth, K.; Duong, T. Q.; and Ghassemi, M. 2020. Covid-19 image data collection: Prospective predictions are the future. *arXiv preprint arXiv:2006.11988*
- [11] Aghasian, E.; Garg, S.; Gao, L.; Yu, S.; and Montgomery, J. 2017. Scoring users’ privacy disclosure across multiple online social networks. *IEEE access* 5: 13118–13130
- [12] Zola, P.; Cortez, P.; Ragno, C.; and Brentari, E. 2019. Social media cross-source and cross-domain sentiment classification
- [13] Cha, V. 2020. Asia’s COVID-19 Lessons for the West: Public Goods, Privacy, and Social Tagging. *The Washington Quarterly* 1–18
- [14] Naby-Grover, T.; Cheung, C. M.; and Thatcher, J. B. 2020. Inside out and outside in: How the COVID-19 pandemic affects self-disclosure on social media. *International Journal of Information Management* 55: 102188
- [15] Fahey, R. A.; and Hino, A. 2020. COVID-19, digital privacy, and the social limits on data-focused public health responses. *International Journal of Information Management* 55: 102181
- [16] Auxier, B. 2020. How Americans see digital privacy issues amid the COVID-19 outbreak. URL <https://www.pewresearch.org/fact-tank/2020/05/04/howamericans-see-digital-privacy-issues-amid-the-covid-19-outbreak/>
- [17] Kye, B.; and Hwang, S.-J. 2020. Social trust in the midst of pandemic crisis: Implications from COVID-19 of South Korea. *Research in social stratification and mobility* 68:100523

Thank you

