東北大学大学院情報科学研究科
純粋・応用数学研究センター
情報数理談話会のお知らせ

日　時：　2022年7月13日㈬ 11:00より12:00まで
場　所：　Google Meetによりオンラインで開催
※参加方法はホームページをご覧下さい

講演者：　Elza Firdiani Sofia 氏（東北大学大学院情報科学研究科)
題　目：　Mathematical Study on the Social Situation-Dependent Prevalence in Epidemics
備　考：　この情報数理談話会は課程博士予備審査会を兼ねています

[概 要]　Since mid-December 2019, several cases of a pneumonia-like disease have emerged which were later identified to be caused by SARS-CoV-2 novel coronavirus (2019-nCoV) and transmitted by exposure to infectious respiratory droplets. As the number of cases had been rising, we first investigated the correlation between activity level and the number of active COVID-19 cases recorded daily by applying statistical analysis. From the analysis, it was concluded that a higher activity level corresponds to a higher number of daily infections. Following that, we constructed a mathematical model to investigate the social situation-dependent epidemic prevalence via the expected number of new infection cases. We considered the level of activity by taking into account the activity phase, whether it takes place solely in the private situation or both private and social spheres followed by the division of the community members into two classes: active and less active. Our mathematical analysis results show that there are critical sizes of classes and proportion of time spent in the activity phase for efficient control of disease spread in the community. Additionally, due to the critical values of such factors, we can divide the community into three types which may need different approaches for mitigating the risk of epidemics. The model provides theoretical frameworks for understanding the best-estimated scenario for controlling the spread of infectious diseases and discussing the perspective of how social structure may impact the risk mitigation strategy during epidemics.

ホームページ：https://www.math.is.tohoku.ac.jp/research/colloquium.html