

# Plenary Lecture II

## Mathematical AI and COVID-19

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Mathematics is closely related to the theory and algorithms of AI and machine learning. In this talk, we investigate how Mathematical AI can help us understand the biomedical and epidemic mechanisms of COVID-19 by three recent studies. First, we look into real-world implications of a rapidly-responsive COVID-19 spread model via deep learning and mathematical modeling. The methodology could also be employed for short-term prediction of COVID-19, which could help the government prepare for a new outbreak. Second, we developed a machine learning model that predicts the mortality of infected patients by using basic patients' information such as age, residence, comorbidity, and past medical history, which can lead to a medical system that allows patients to check their own severity. Third, we analyzed the difference in the immune response of T cells between COVID-19 patients and non-patients using artificial intelligence. This method was superior to the existing statistical methods in classifying COVID-19 patients and was also effective in predicting the severity of the disease.

### References

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