




## Data Science and Analytics Webinar Series 2021

# Combating COVID-19 with Computational Approaches

 **8 Feb 2021** (Mon)  
 **18:00 – 18:50** (HKT, UTC+08:00)  
 **Online via Zoom**  
(Link to be provided upon registration)



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### Abstract

Since early 2020, COVID-19 has spread very quickly in the world, and many people are suffering from either the disease itself or the social, political, and economic impacts it generated. In this talk, I will briefly introduce our efforts on combating COVID-19 from both the epidemiology and virology perspectives. First, we built a deep learning based forecasting model which can make accurate prediction of the future infections and death tolls of COVID-19 based on historical time series data. The model was released on the US CDC website, and its forecasting accuracy is ranked very top among all 40+ models on the website. Second, we performed molecular dynamic simulation on different conformations of the SAR-COV-2 virus and their mutual transitions. Through the simulation we discovered the “wedge” effect of the NTD part of the S-protein in affecting the infectivity of the virus. Therefore, NTD could serve as a new drug target. We then performed molecular docking and identified several lead compounds that could potentially be useful for drug design and vaccine development.

### About the speaker

Tie-Yan Liu is an assistant managing director of Microsoft Research Asia, a fellow of the IEEE, and a distinguished scientist of the ACM. He is also an adjunct/honorary professor at Carnegie Mellon University (CMU), University of Nottingham, and Tsinghua University. He is well known for his pioneer work on machine learning for information retrieval, and recently he has done impactful research on deep learning, reinforcement learning, and distributed learning. He published 200+ papers in top conferences and journals, with tens of thousands of citations. He has served as PC chair or area chair for a dozen of top conferences including WWW/WebConf, SIGIR, KDD, ICML, NIPS, ICLR, IJCAI, AAAI, ACL, as well as associate editor of ACM Transactions on the Web and IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI). He won the best (student) paper award at SIGIR (2008) and ACML (2018), the most cited paper award at Journal of Visual Communications and Image Representation (2004-2006), the most cited Chinese researcher award by Elsevier (2017, 2018), China AI Leader Award – Technical Innovation (2018), Most Influential Scholar Award by AMiner (2007-2017). His team released LightGBM in 2017, which has become one of the most popularly used machine learning tools in Kaggle and KDD Cup; his team helped Microsoft achieve human parity in machine translation in 2018 and won 8 champions in the WMT machine translation contest in 2019; his team also built the world-best Mahjong AI, named Suphx, which achieved 10 DAN on the Tenhou Mahjong platform in mid 2019.



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