

# Dong Wang

Postdoctoral Fellow with a Ph.D. in **Mathematics** and expertise in **mathematical modeling, statistical inference, and complex network** analysis. Experienced in integrating **epidemiological, genomic, environmental** and **human mobility** data to improve infectious disease surveillance and forecasting. Passionate about applying quantitative methods to real-world public health challenges and contributing to operational decision-making.

**Gender:** Male

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## **Present academic position:**

Post-doctoral Fellow School of Public Health The University of Hong Kong  
<https://sph.hku.hk/en/Biography/Wang-Dong>

Educations

2016–2021	<u>Ph.D. of Science</u> <b>Major:</b> Mathematics <b>School:</b> School of Science <b>Institution:</b> Harbin Institute of Technology, Shenzhen, China
2015–2016	Master stage (MD-PhD based program) <b>Institution:</b> Harbin Institute of Technology, Shenzhen, China
2011–2015	<u>Bachelor of Science</u> <b>Major:</b> Information and Computing Science <b>School:</b> School of Mathematics and Computer Science <b>Institution:</b> Northwest Minzu University, Lanzhou, China

## Skills

Epidemiology; Mathematical and statistical modeling; Complex network analysis; Bayesian hierarchical modeling; Genomic epidemiology; Forecasting infectious diseases; Analysis of collective behavior.

*Particularly adept at higher-order infectious disease modeling that synthesizes epidemiological, geographic, phylogenetic, and network approaches to elucidate the impact of viral evolution and human mobility on shaping patterns of disease transmission.*

### Interests

Quantitative high-order modeling of infectious disease transmission, with particular emphasis on the integration of multiple data streams, including epidemiological, genomic datasets, human mobility, and non-pharmaceutical intervention etc, to improve our understanding and prediction of infectious disease dynamics, and to inform the development of more effective spatial/global disease control strategies. Interested in developing and applying complex models to real-world public health

problems, including forecasting infectious diseases and optimizing surveillance strategies.

## Softwares

Extensive experience with **R**, including data visualization (*ggplot2*), bioinformatics workflows, and, in particular, mathematical modeling and statistical inference via **RStan**. Proficient in **Python** for data manipulation and analysis (*pandas* and others), as well as **MATLAB** for numerical computations and algorithmic development.

## Project

Reference number	Project title	Capacity (PI / Co-I)	Funding source(s) and amount
22210582	The impact of higher-order interactions in human mobility networks on the transmission of COVID-19 in Hong Kong and mainland China	PI	Health and Medical Research Fund (HMRF) HK\$551,440.00
17100225	Identifying the dynamical interaction among respiratory viruses including influenza and COVID-19, and prediction of their cocirculation burden in the post-pandemic period using multi-stream data	Co-I	General Research Fund (GRF) HK\$1,015,417

## Publishing

- [1] **Dong Wang**, Yiu-Chung Lau, Songwei Shan, Dongxuan Chen, et al Ensemble forecasting of influenza activity and dynamical characteristics during and post-COVID-19 pandemic era in subtropical location, to be resubmitted to eBIOMed, 2025.
- [2] **Dong Wang** *et al.* Social reinforcements and the spatiotemporal characteristics for the transmission dynamics of SARS-CoV-2 in mainland China (Completed; manuscript to be submitted to Nature).

## Publications

- [1] D. Chen, D.C. Adam, YC Lau, **Dong Wang** *et al.* Investigating setting-specific superspreading potential and generation intervals of COVID-19 in Hong Kong. *Nat Commun* **16**, 5816 (2025).
- [2] YC Lau, S Shan, **Dong Wang** *et al.* (2024) Forecasting of influenza activity and associated hospital admission burden and estimating the impact of COVID-19 pandemic on 2019/20 winter season in Hong Kong. *PLOS Computational Biology* **20**(7): e1012311.
- [3] **Dong Wang**, Yi Zhao, Jianfeng Luo, Hui Leng, Simplicial SIRS epidemic models with nonlinear incidence rates, *Chaos*, **31**(5), 053112 2021.
- [4] **Dong Wang**, Michael Small, Yi Zhao, Exploring the optimal network topology for spreading dynamics, *Physica A*, **564**, 125535, 2021.
- [5] **Dong Wang**, Yi Zhao, Hui Leng, Michael Small. A social communication model based on simplicial complexes, *Physics Letters A*, **384** (35), 126895, 2020.
- [6] **Dong Wang**, Yi Zhao, Hui Leng, Dynamics of epidemic spreading in the group-based multilayer networks, *Mathematics*, **8**(11), 1895, 2020.
- [7] **Dong Wang**, Yi Zhao, Network community detection from the perspective of time series, *Physica A*, **522**,

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***Conference***

1. Forecasting of influenza activity using multi-stream surveillance data in Hong Kong (Oral). OPTIONS XI, UK (2022)
  2. Forecasting global influenza activities using multi-stream surveillance data (Poster). EPIDEMIC 9, Italy (2023)
  3. Prediction of influenza hospital admission rates across age groups in Hong Kong using multi-stream surveillance data (Poster). OPTIONS XII, Australia (2024)
  4. The COVID-19 transmission dynamics in mainland China: a higher-order spatiotemporal modeling study (Poster).OPTIONS XII, Australia (2024)
  5. Social reinforcements and the spatiotemporal characteristics for the transmission dynamics of SARS-CoV-2 in mainland China (Oral), EPIDEMIC 10 USA (2025 upcomming)
  6. Disentangling the multifaceted drivers of disease transmission: a bayesian hierarchical model of climate, air quality, and contact patterns in Hong Kong (Poster), EPIDEMIC 10 USA (2025 upcomming)
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***Contact information for reference***

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**Prof. Ali Sheikh Taslim**      *alist15@hku.hk*

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Highly motivated to contribute to projects that integrate **epidemiology**, and **mathematical/statiscal modelling** to support public health decision-making.