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RESEARCH FIELDS

public health, complex networks, statistics, epidemiology, disaster response.

CURRENT POSITION

Sep, 2012 – present, Co-founder & Board at Flowminder Foundation.
Jan, 2019 – present, professor at College of Systems Engineering, National University of Defense Technology, Changsha.

EDUCATION & WORK EXPERIENCE

Jan, 2015 – Dec, 2018, associate professor at College of Information System & Management, National University of Defense Technology, Changsha.
Feb, 2013 – Dec, 2014, lecturer at College of Information System & Management, National University of Defense Technology, Changsha.
Mar, 2013 – May, 2013, researcher at the Institute For Future Studies in Stockholm, full time.
Jan, 2009– Feb, 2013, assistant researcher at the Department of Sociology, Stockholm, 40%.
Jan, 2010– Mar, 2013, assistant researcher at the Department of Public Health Sciences, Karolinska Institutet, Stockholm, 20%.
Dec, 2009 – Feb, 2013, PhD from Department of Public Health Sciences, Karolinska Institute, Stockholm
Sep, 2006 – Dec, 2008, Master & PhD Candidate at College of Information System & Management, National University of Defense Technology, Changsha.
Aug, 2002 – Jun, 2006, Bsc from Sichuan University, Chengdu.

SELECTIVE PUBLICATIONS

Lu X*, et al., *Mobile Phone-Based Population Flow Data for the COVID-19 Outbreak in Mainland China*. **Health Data Science**, 2021. 2021: p. 9796431.

Jia J#, **Lu X#**, et al. *Population flow drives spatio-temporal distribution of COVID-19 in China.* **Nature**, 2020. 582(7812): p. 389-394.

Zhou, B, **Lu X***, and Holme P, *Universal evolution patterns of degree assortativity in social networks*. **Social Networks**, 2020. 63: p. 47-55.

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Buckee C O, Tatem A, Wetter E, **Lu X**, and Bengtsson L. *Society: Protect Privacy of Mobile Data*. **Nature**, 514,

7520 (2014): 35-35. (correspondence）

Lu X, Brelsford C. *Network Structure and Community Evolution on Twitter: Human Behavior in Response to The 2011 Japanese Earthquake and Tsunami*. **Scientific Reports**, 2014, 4, 6773.

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Bengtsson L, **Lu X**, et al. *Improved Response to Disasters and Outbreaks: Tracking Population Movements with Mobile Phone Network Data in Haiti*. **PLOS Medicine**, 2011; 8 (8): e1001083

PEER-REVIEWED PAPERS

[1] **Lu, X**., J. Tan, Z. Cao, Y. Xiong, S. Qin, T. Wang, C. Liu, S. Huang, W. Zhang, L.B. Marczak, S.I. Hay, L. Thabane, G.H. Guyatt, and X. Sun, Mobile Phone-Based Population Flow Data for the COVID-19 Outbreak in Mainland China. Health Data Science, 2021. 2021: p. 9796431.

[2] Cai, M., G. Huang, M.E. Kretzschmar, X. Chen, and **X. Lu**, Extremely Low Reciprocity and Strong Homophily in the World Largest MSM Social Network. IEEE Transactions on Network Science and Engineering, 2021: p. 1-1.

[3] Chen, S., X. Zhang, Y. Zhou, K. Yang, and **X. Lu**, COVID-19 protective measures prevent the spread of respiratory and intestinal infectious diseases but not sexually transmitted and bloodborne diseases. Journal of Infection, 2021.

[4] 赛斌, 曹自强, 谭跃进, and 吕欣, 基于目标跟踪与轨迹聚类的行人移动数据挖掘方法研究. 系统工程理论与实践, 2021. 41(1): p. 231-239.

[5] 戴碧涛, 谭索怡, 陈洒然, 蔡梦思, 秦烁, and 吕欣, 基于手机大数据的中国人口迁徙模式及疫情影响研究. 物理学报, 2021. 70(6): p. 068903-1.

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[11] Feng, P., **X. Lu**, Z. Gong, B. Li, and D. Sun, Social network analysis model for research on organizational structure of the pyramid scheme communication network. MethodsX, 2021. 8: p. 101259.

[12] Jia, J.S., **X. Lu**, Y. Yuan, G. Xu, J. Jia, and N.A. Christakis, Population flow drives spatio-temporal distribution of COVID-19 in China. Nature, 2020. 582(7812): p. 389-394.

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[15] Li, Y., M. Cai, S. Qin, and **X. Lu**, Depressive Emotion Detection and Behavior Analysis of Men Who Have Sex With Men via Social Media. Frontiers in Psychiatry, 2020. 11: p. 830.

[16] Zhou, T., Q. Liu, Z. Yang, J. Liao, K. Yang, W. Bai, **X. Lu**, and W. Zhang, Preliminary prediction of the basic reproduction number of the Wuhan novel coronavirus 2019-nCoV. Journal of Evidence-Based Medicine, 2020. 13(1): p. 3-7.

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Multilingual Text from Blued. International Journal of Environmental Research and Public Health, 2019. 16(19): p. 3597.
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PUBLIC RESEARCH REPORTS

With Bengtsson L, Richard Garfield, Anna Thorson, Johan von Schreeb. "*Internal population displacement in Haiti: preliminary analyses of movement patterns of Digicel mobile phones: 1 January to 11 March 2010*." **Karolinska Institute, Columbia University**, 2010. http://reliefweb.int/report/haiti/internal-population-displacement-haiti-preliminary-analyses-movement-patterns-digicel

With Bengtsson L, Richard Garfield, Anna Thorson, Johan von Schreeb. "*Internal Population displacement in Haiti - Preliminary analyses of movement patterns of Digicel mobile phones: 1 December 2009 to 18 June 2010*." **Karolinska Institute, Columbia University**, 2010. http://reliefweb.int/report/haiti/internal-population-displacement-haiti-preliminary-analyses-movement-patterns-digicel-0

With Bengtsson L, Richard Garfield, Anna Thorson, Johan von Schreeb. "*Saint-Marc Cholera Outbreak: Analyses of ongoing population movements from the Saint-Marc area, Haiti.*" **Karolinska Institute, Columbia University**, 2010. http://reliefweb.int/report/haiti/saint-marc-cholera-outbreak-analyses-ongoing-population-movements-saint-marc-area-haiti

With Bengtsson L, Richard Garfield, Anna Thorson, Johan von Schreeb. "*Preliminary analyses of movement patterns of Digicel mobile phones: 1 December 2009 to 19 December 2010*." **Karolinska Institute, Columbia University**, 2011. http://reliefweb.int/report/haiti/internal-population-displacement-haiti-preliminary-analyses-movement-patterns-digicel-1

With Flowminder and WorldPop, "Population distributions and mobility patterns in West Africa for supporting efforts in controlling ebola virus outbreak" by **WorldPop** 2014. http://www.worldpop.org.uk/ebola/

With Flowminder, "*Mobile phone data and disaster response – Bangladesh*", in "World humanitarian: data and trends 2014" by **UNOCHA** 2015. http://interactive.unocha.org/publication/2014_datatrends/

With Flowminder, "*Nepal Floods July 2016 Population Mobility, Displacement and Impacted Areas Based on Analyses of Anonymized Mobile Network Data*" by **Flowminder** 2016. http://reliefweb.int/report/nepal/nepal-floods-july-2016-population-mobility-displacement-and-impacted-areas-based

With David Wrathall, "*Using mobile network data to understand climate change and migration*", **UK Climate & Migration Coalition (UKCMC)** 2017. http://climatemigration.org.uk/mobile-network-data-provide-new-insights-on-climate-change-and-migration/

SKILLS

Skilled in C, C#, SQL database, Matlab and ArcGIS; Chinese (native) and English (fluent);

PROJECTS

Jan, 2021-

PI for National Science Fund for Distinguished Young Scholars fund no. 72025405 "Humanitarian Work with Big Data: Data-driven Models for Poverty, Disease and Disasters"

Feb, 2020-

PI for Nature Science Foundation fund no. 82041020 "Study on the exported infection risk and contact network transmission model of 2019-nCoV based on national level population mobility data"

- In collaboration with Hongkong University, Sichuan University, West China Hospital and University of Electronic Science and Technology of China.

Feb, 2020-

PI for Sichuan Science and Technology Plan Project fund no. 2020YFS0007 "Evaluation and Predection of COVID-19 Based on Big Data of Geo-location"

- In collaboration with Sichuan University, West China Hospital and University of Electronic Science and Technology of China.

Jan, 2018-

PI for Nature Science Foundation fund no. 71771213 "Analysis of Hidden Population and Key Technologies of Network Sampling for Online Community Data"

- In collaboration with China CDC, Karolinska Institutet and Peking University.

Jan, 2017-

Core member for Nature Science Foundation fund no. 71690233 "Task Integration Management on the Innovative Development of High-End Equipment Manufacturing in the Internet and Big Data Era"

- In collaboration with Tsinghua University, Tongji University etc.

Jan, 2016- 2018

PI for Nature Science Foundation Excellent Young Scientists fund no. 71522014 "Big data mining and emergency management"

- In collaboration with China CDC, Karolinska Institutet and Flowminder foundation.

Jan, 2014- 2016

Co-applicant for VR grant funded by Swedish Research Council "Using mobile phone data from 25 million subscribers in four low- and middle-income countries to support elimination child deaths, malnutrition and poverty"

- In collaboration with Karolinska Institutet, Flowminder foundation, Southampton University, MIT and Harvard University.

Jan, 2014- 2016

PI for Nature Science Foundation Young Scientists fund no. 71301165 “Mobile Communication and Online Social Media Based Study of Human Dynamics under Large-Scale Emergencies”

- In collaboration with China CDC, Karolinska Institutet and Flowminder foundation.

Dec, 2013- 2015

PI for pre-research project “Data Mining and Visualization of Time Series Data from Online Social Networks”

- In collaboration with National University of Defense Technology.

Mar, 2010- 2011

Major researcher in using mobile phone data from Haiti tracking population movements during earthquake and outbreak of cholera

- In collaboration with Columbia University and United Nations Population Fund (UNFPA).

Jan, 2010- Dec, 2012

EU project ISSC: An integrated surveillance system for infectious disease in rural China.

- Designing/selecting surveillance models and integrating models with the system.
- In collaboration with Karolinska Institute, Heidelberg University, Huazhong University of Science & Technology, and Fudan University.

Teaching (selected)

Complex Systems: Theory and Applications (36hrs，master and phd students)

(Covering a range of complexity theory, including adaptive systems, generic algorithm, complex networks etc. Software use: Gephi)

Applied Multivariate Statistical Analysis (60hrs master and phd students)

(Basic algebra and probability theory, statistic Concepts, correlation, hypothesis testing, linear and non-linear regression, GLM, factor analysis, clustering, spatial data analysis, anomaly detection etc. Software use: SPSS, Matlab, Gephi, ArcGIS)

Emergency Management (8hrs, training course for officials)

(The theory of emergency management, prevention, mitigation, preparedness, response and recovery, psychological basics on emergency situations, advances in disaster response)

Data Analytic Basics (8 hrs, training course for officials)

(Statistic concepts, descriptive statistics, correlation, hypothesis testing, regression and prediction, data visualization. Software use: Matlab)

Managerial Statistics (36 hrs, mpa)

(Statistic concepts, descriptive statistics, correlation, hypothesis testing, regression, factor analysis and case studies. Software use: SPSS)

Statistic Practice with SPSS (18 hrs, mpa)

(Data preparation, visualization, descriptive statistics, correlation, hypothesis testing, regression, factor analysis. Software use: SPSS)