Wei Chien Benny CHIN 陳威全

a Geographer, Cartographer, & Geographical Information Scientist

Personal Information

Current position:	Postdoctoral Researcher at Singapore University of Technology and Design
Email:	wcchin.88@gmail.com ; benny_chin@sutd.edu.sg
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Phone/WhatsApp:	+65-9455-3458
Nationality:	Malaysian
Language:	English (Upper intermediate), Chinese (Native), Malay (Basic)

Education

2014 - 2018	**Ph.D.**, Department of Geography, National Taiwan University. Thesis : The scaling properties of point clustering phenomena Advisor : Prof. Tzai-Hung Wen
2011 - 2013	**M.Sc.**, Department of Geography, National Taiwan University. Thesis: Geographically Modified PageRank Algorithm: Measuring the importance of nodes in a geospatial network. Advisor: Prof. Tzai-Hung Wen
2007 - 2011	**B.Sc.**, Department of Geography, National Taiwan University. Thesis: The spatial relationship between urbanization factors, environmental quality and health quality. Advisor: Prof. Mei-Hui Li

Awards and Scholarships

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2018	**Dean's Award(Ph.D.)** - College of Science, National Taiwan University, Taiwan.
2017	**Young Scientist Award** - Tsukuba Global Science Week, University of Tsukuba, Japan.
2017	**Excellent Student Poster Award** - Annual Meeting of the Taiwan Society for Risk Analysis, Taiwan.
2012, 2015-17	**Scholarship** for Outstanding Overseas Chinese Graduate Student - Ministry Of Education, Taiwan.
2010	College Student Research **Scholarship**, National Science Council, Taiwan.

Computer Skills

Programming	Python, R, Netlogo, Java, Javascript, Processing, Julia, Matlab
GIS	ArcGIS, QGIS
Cartography	Illustrator, Inkscape, web-mapping
Database	PostgreSQL, SQLite
Familiar OS	Linux, Windows

Research Interests

- **Geocomputation**
- Network Analysis
- Space-time Analysis
- Human Movement
- Scaling
- Spatial Visualization

Research Foci
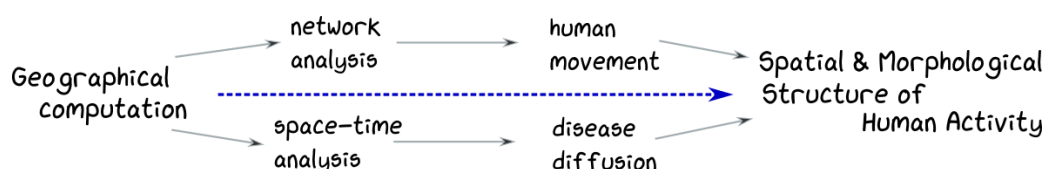
Publication / current work

In Refereed Journal / Book

Geocomputation, Human Movement & Network Analysis

- **Chin, W. C. B.**, & Bouffanais, R.* (Accepted on 2020 Oct). Spatial super-spreaders and super-susceptibles in human movement networks. *Scientific Reports* (In press).
  arXiv: https://arxiv.org/abs/2005.05063

- Huang, C. Y., & **Chin, W. C. B.*** (2020) Distinguishing arc types to understand complex network strength structures and hierarchical connectivity patterns. *IEEE Access* 8: 71021-71040.
  DOI: https://doi.org/10.1109/ACCESS.2020.2986017

- Huang, C. Y., **Chin, W. C. B.***, Fu, Y. H., & Tsai, Y. S. (2019) Beyond bond links in complex networks: Local bridges, global bridges and silk links. *Physica A: Statistical Mechanics and its Applications*.
  DOI: https://doi.org/10.1016/j.physa.2019.04.263

- Huang, C. Y., **Chin, W. C. B.***, Wen, T. H., Fu, Y. H., & Tsai, Y. S. (2019). EpiRank: Modeling Bidirectional Disease Spread in Asymmetric Commuting Networks. *Scientific Reports* 9: 5415. (IF:4.122, Q1 in Multidisciplinary Sciences)
  DOI: https://doi.org/10.1038/s41598-019-41719-8

- Wen, T. H.*, **Chin, W. C. B.**, & Lai, P. C. (2017). Understanding the topological characteristics and flow complexity of urban traffic congestion. *Physica A: Statistical Mechanics and its Applications* 473: 166-177. (IF:2.132, Q2 in Physics, Multidisciplinary)
  DOI: https://doi.org/10.1016/j.physa.2017.01.035

- Lin, M. H., Kuo, R. N., **Chin, W. C. B.**, & Wen, T. H.* (2016). Profiling the patient flow for seeking healthcare in Taiwan: using gravity modeling to investigate the influences of travel distance and healthcare resources. *Taiwan Journal of Public Health* 35(2): 136-151. (TSSCI, full text in chinese, with english abstract)
  DOI: https://doi.org/10.6288/TJPH201635104086

- Wen, T. H.*, **Chin, W. C. B.**, & Lai, P. C. (2016). Link structure analysis of urban street networks for delineating traffic impact areas. In M. Nemiche, M. Essaaidi (eds.), *Advances in Complex Societal, Environmental and Engineered Systems, Nonlinear Systems and Complexity 18*. Part 2: 203-220. Springer: Switzerland. ISBN: 978-3-319-46164-9.
  DOI: https://doi.org/10.1007/978-3-319-46164-9_10

- **Chin, W. C. B.**, & Wen, T. H.* (2015). Geographically modified PageRank algorithms: Identifying the spatial concentration of human movement in a geospatial network. *PLoS ONE* 10(10): e0139509. (IF:2.766, Q1 in Multidisciplinary Sciences)
  DOI: https://doi.org/10.1371/journal.pone.0139509

- Wen, T. H.*, & **Chin, W. C. B.** (2015). Incorporation of spatial interactions in location networks to identify critical geo-referenced routes for assessing disease control measures on a large-scale campus. *International Journal of Environmental Research and Public Health* 12(4): 4170-4184. (IF:2.145, Q2 in Environmental Sciences)
  DOI: https://doi.org/10.3390/ijerph120404170

Geocomputation & Space-Time Analysis

- **Chin, W. C. B.**, Wen, T. H.*, Sabel, C. E., & Wang, I. H. (2017). A geo-computational algorithm for exploring the structure of diffusion progression in time and space. *Scientific Reports* 7: 12565. (IF:4.122, Q1 in Multidisciplinary Sciences)
  DOI: https://doi.org/10.1038/s41598-017-12852-z

- Wen, T. H.*, Tsai, C. T., & **Chin, W. C. B.** (2016). Evaluating the role of disease importation in the spatiotemporal transmission of indigenous dengue outbreak. *Applied Geography* 76: 137-146. (IF:3.117, Q1 in Geography)
  DOI: https://doi.org/10.1016/j.apgeog.2016.09.020

- Lee, J.*, Lay, J. G., **Chin, W. C. B.**, Chi, Y. L., & Hsueh, Y. H. (2014). An experiment to model spatial diffusion process with nearest neighbor analysis and regression estimation. *International Journal of Applied Geospatial Research* 5(1): 1-15.
  DOI: https://doi.org/10.4018/ijagr.2014010101

Submitted / In Preparation

- Yan, Y. **Chin, W. C. B.***, Leong C.-H., Wang Y.-C., & Feng C.-C. Emotional responses through COVID-19 in Singapore. (Under review)

- Leong C.-H.*, **Chin, W. C. B.**, Wang Y.-C., & Feng C.-C. A socio-ecological perspective on COVID-19 spatiotemporal integrated vulnerability in Singapore. (Under review)

- Manivannan A., **Chin, W. C. B.**, Barrat A. & Bouffanais R.* On the use of barometric sensors to track human activity. (Under review)

- Multi-sensor identification of Vertical Displacement Activity. (In preparation)

- Geographical analysis of the vertical displacement activity during the journey to/from school. (Planning)

- Fractal skyline: Assessing the self-similarity properties in urban vertical landscape. (In preparation)

- Fractal skyline: Exploring the vertical complexity through the spatial scaling errors. (Planning)

- The effects of point clustering properties on spatial scaling patterns. (Planning)

Conference Presentation

- 2018 - Delineating communities of cities in space and times, in **18th Chinese Cartography Academic Conference**, Taipei, Taiwan. 20 October 2018.

- 2017 - Lifestyle of a city: An urban life footprint analysis using Twitter data in Tokyo, in **TGSW 2017 - 1st CiC Student Workshop**, Tsukuba, Japan. 27 September 2017. Young Scientist Award

- 2017 - Exploring space-time diffusion process of Dengue Fever in Kaohsiung City, Taiwan, in **7th Asian Seminar in Regional Science**, Taipei, Taiwan. 9 September 2017.

- 2017 - Applying space-time information to explore disease processes: The dynamic patterns of Dengue Fever in Kaohsiung City, 1998-2015, in **Annual Meeting of the SRA Taiwan 2017**, Taichung, Taiwan. 25-26 May 2017. Excellent Student Poster Award

- 2016 - Profiling topological characteristics of street network to identify urban traffic congestion, in **15th Conference for Global Spatial Data Infrastructure Association (GSDI)**, Taipei, Taiwan. 1 December 2016.

- 2016 - Understanding urban traffic congestion by analyzing the link structure and the vehicle flows of urban street network, in **8th Conference on Development Studies**, Taipei, Taiwan. 16 October 2016.

- 2016 - Link structure analysis of urban road networks for identifying traffic impact areas, in **NetSci 2016**, Seoul, South Korea. 2 June 2016.

- 2015 - A web-based framework for monitoring spatial-temporal clustering of epidemics in Taiwan, in **FOSS4G 2015**, Seoul, South Korea. 17 September 2015.

- 2013 - Geographically modified PageRank algorithm: Measuring the importance of nodes in a geospatial network, in **AAG Annual Meeting 2013**, Los Angeles, USA. 9 April 2013.

- 2012 - Integration of PageRank and spatial interaction modeling to analyze topological dynamics of networked cities, in **Annual Meeting of The Geography Society of China located in Taipei**, Taipei, Taiwan. 21 April 2012.

Professional Experience

2015-2018	An urban environmental sensing infrastructure with crowdsourcing and spatial big data for early warning of critical conditions: A space-time multi-layered urban mobility model for assessing transmission risk of infectious disease. (Proposal writer and project executor) 3 years project funded by *MOST Taiwan*.
2015	A production model for developing geographic network analysis module. (Proposal writer and project executor) 1 year project funded by *MOST Taiwan*.
2015-2017	Incorporating the seasonal incidence into detecting spatial-temporal thresholds of food-borne disease outbreaks for the epidemic early warning system. (Proposal writer and project executor (2015-16); data analysis (2017)) 3 years project funded by *Taiwan CDC*.
2016-2019	A framework for high spatial and temporal resolution geodemographic segmentation. (Proposal writer and programmer) 3 year project funded by *MOST Taiwan*.
2014-2016	Integration of geographic information with social network analysis to establish a geospatial model for predicting tuberculosis (TB) contacts with latent infection and developing active disease. (Proposal writer) 3 years project funded by *MOST Taiwan*.

Personal Open Source Project

Data analysis algorithms

Hierarchical Arc Type Analysis (HATA)

Description	An algorithm for evaluating the strength of directed arcs.
Repository	https://github.com/wcchin/HATA

Hierarchical Edge Type Analysis (HETA)

Description	An algorithm for evaluating the strength of edges.
Repository	https://github.com/wcchin/HETA

Geographical PageRank (GPR)

Description	a python package for measuring concentration distribution in a spatial network.
Repository	https://bitbucket.org/wcchin/gpras
Pypi	https://pypi.python.org/pypi/GPRas

Flow-based PageRank (FBPR)

Description	a python package that calibrate the attractiveness and PR score to meet the flow.
Repository	https://bitbucket.org/wcchin/fbpr

TrAcking Progression In Time And Space (TaPiTaS)

Description	A data exploration and visualization algorithm for understanding diffusion process.
Repository	https://bitbucket.org/wcchin/TaPiTaS
Pypi	https://pypi.org/project/tapitas/

Tools

Taiwan Geographic Open Data (TGOD)

Description	a python package that wrap some open data real-time API (Taiwan) and convert the data into dataframe format.
Repository	https://github.com/wcchin/tgod

Vector MAP ProducER (vmapper)

Description	a simple python library for creating SVG map in python.
Repository	https://github.com/wcchin/vmapper

ColouringMap (colouringmap)

Description	a convenient mapping tool for generating categories and colours for making choropleth map from geopandas geodataframe.
Repository	https://github.com/wcchin/colouringmap