

陳威全

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### Research Interests

- Methods for spatial analysis on point patterns
- Methods for space-time analysis for understanding the development of point events
- Geospatial network analysis and transportation geography
- Spatial and space-time computational algorithms
- Geographical data visualisation

### Education

- 2014-(in progress)  
Ph.D., Department of Geography, National Taiwan University.  
Thesis: A point data exploration algorithm for understanding the space-time progression pattern of the movement process of point events.  
Advisor: 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: 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: Mei-Hui Li

### Publications

#### SSCI Journal Article

- 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. DOI: 10.1016/j.physa.2017.01.035  
(Journal rank: 23/79 in Physics, Multidisciplinary Science)
- 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. DOI: 10.1016/j.apgeog.2016.09.020  
(Journal rank: 10/77 in Geography)
- **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. DOI: 10.1371/journal.pone.0139509  
(times cited: 5)
- 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. DOI: 10.3390/ijerph120404170  
(times cited: 1)
- 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: 10.4018/ijagr.2014010101  
(times cited: 3)

#### Book Chapter

- 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. Essaïdi (eds.), *Advances in Complex Societal, Environmental and Engineered Systems, Nonlinear Systems and Complexity 18*. Part 2: 203-220. Springer: Switzerland. DOI: 10.1007/978-3-319-46164-9\_10, ISBN: 978-3-319-46164-9.

## TSSCI Journal Article

- 郭年真, 林民浩, 陳威全, 溫在弘 (2016)。剖析台灣民眾的就醫流動：利用引力模式評估就醫距離與醫療資源分布的影響。 *台灣衛誌* 35(2) : 136-151. DOI: 10.6288/TJPH201635104086  
(eng. info) Lin, M. H., Kuo, R. N., Chin, W. C. B., & Wen, T. H. (2015). 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. DOI:10.6288/TJPH201635104086.  
(times cited: 1)

## Manuscript in preparation

- **Chin, W. C. B.**, Wen, T. H., Sabel, C. E., & Wang, I. H. A geo-computational algorithm for exploring the structure of diffusion progression in time and space.  
(submitted).

## Conferences Presentations

- 2017 - Exploring space-time diffusion process of Dengue Fever in Kaohsiung City, Taiwan, accepted for oral presentation in **7th Asian Seminar in Regional Science**, Taipei, Taiwan.  
[in preparation]
- 2017 - Applying space-time information to explore disease processes: The dynamic patterns of Dengue Fever in Kaohsiung City, 1998-2015. Poster session in **Annual Meeting of the SRA-Taiwan 2017**, Taichung, Taiwan. **Excellent Student Poster Award**  
Link: [https://wcchin.github.io/pdfs/poster\\_tsra\\_2017.pdf](https://wcchin.github.io/pdfs/poster_tsra_2017.pdf)
- 2016 - Profiling topological characteristics of street network to identify urban traffic congestion, in **15th Conference for Global Spatial Data Infrastructure Association (GSDI)**, Taipei, Taiwan.  
Link: <http://bit.ly/gsdi2016chin>
- 2016 - 從路段的連接性與流率分析城市內街道的流量以探討城市交通擁塞問題，發展研究年會，臺北，臺灣。  
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.  
Link: <http://bit.ly/acds2016chin>
- 2016 - Link structure analysis of urban road networks for identifying traffic impact areas, in **NetSci 2016**, Seoul, South Korea.  
Link: <http://bit.ly/netsci2016benny>
- 2015 - A Web-based Framework for Monitoring Spatial-temporal Clustering of Epidemics in Taiwan, in **FOSS4G 2015**, Seoul, South Korea.  
Link: <http://bit.ly/foss4g2015chin>
- 2014 - 考量地理特性的 PageRank 演算法：評估地理網絡節點之重要性，中國地理學會年會，臺北，臺灣。  
Geographically modified PageRank algorithms: Measuring the importance of nodes in a geospatial network, in **Annual Meeting of The Geography Society of China located in Taipei**, Taipei, Taiwan.  
Link: <http://bit.ly/gprGEOGSOC2014>
- 2013 - Geographically modified PageRank Algorithm: Measuring the importance of nodes in a geospatial network, in **AAG Annual Meeting 2013**, Los Angeles, USA.  
Link: <http://bit.ly/gprAAG2013>
- 2012 - 整合PageRank與空間互動模型於網絡都市的拓撲動態分析，中國地理學會年會，臺北，臺灣。  
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.  
Link: <http://bit.ly/cityPR2012>

## Lab Project Participations

### Person In charge:

- 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.  
Funded by Ministry of Science and Technology (MOST) of Taiwan. 3 years project (2015-2018).
- A Production Model for Developing Geographic Network Analysis Module.  
Funded by Ministry of Science and Technology (MOST) of Taiwan. 1 year project (2015).

## Assistance:

- Incorporating the Seasonal Incidence into Detecting Spatial-Temporal Thresholds of Food-borne Disease Outbreaks for the Epidemic Early Warning System.  
Funded by Taiwan Centers for Disease Control (CDC). 3 years project (2015-2017). work: in-charge on a sub-project.
- A Framework for High Spatial and Temporal Resolution Geodemographic Segmentation.  
Funded by Ministry of Science and Technology (MOST) of Taiwan. 3 years project (2016-2019). work: proposal writing.
- 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.  
Funded by Ministry of Science and Technology (MOST) of Taiwan. 3 years project (2014-2016). work: proposal writing.

## Personal Open Source Projects (products of researches and projects)

- Geographical PageRank (GPR) - a python package that provide functions of algorithms for measuring concentration distribution in a spatial network.  
Project page: <https://wcchin.github.io/geographical-pagerank-algorithms.html>  
repository: <https://bitbucket.org/wcchin/gpras>  
MIT license
- Flow-based PageRank (FBPR) - a python package that run an algorithm that calibrate the weight and PR score to meet the flow.  
Project page: <https://wcchin.github.io/flow-based-pagerank.html>  
repository: <https://bitbucket.org/wcchin/fbpr>  
MIT license
- Taiwan Geographic Open Data (TGOD) - a python package that wrap some of the Taiwan open data real-time api, and some static map layers files inside the package, that can be called through some functions and get the data in dataframe or geodataframe format.  
Project page: <https://wcchin.github.io/tgod/>  
repository: <https://github.com/wcchin/tgod>  
BSD-3-clause license.
- Vector MAP ProducER (vmapper) - a simple python library for creating SVG map in python.  
Project page: <https://wcchin.github.io/vmapper.html>  
repository: <https://github.com/wcchin/vmapper>  
MIT license

## Scholarships

- 2016 - 1st Semester Scholarship from MOE for Outstanding Overseas Chinese Graduate Student.
- 2015 - 2nd Semester Scholarship from MOE for Outstanding Overseas Chinese Graduate Student.
- 2012 - 1st Semester Scholarship from MOE for Outstanding Overseas Chinese Graduate Student.
- 2010 - College Student Research Scholarship, NSC.  
MOE: Ministry of Education;  
NSC: National Science Council (currently Ministry of Science and Technology, MOST).

## Skills

### Programming

- python: data analysis and visualisation, data collection from open data, web-application.
- processing: animated geographical visualisation.
- R: data analysis.

### Cartography

- ArcGIS: static maps producing and analysis.
- QGIS: static maps producing and analysis

### Database

- PostgreSQL/PostGIS: database maintaining and using.

## Language

- Chinese
- English