

CURRICULUM VITAE

Zhuojie Huang
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OFFICE ADDRESS

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RESEARCH INTERESTS:

Big Data Analytics, GIS, Spatial Epidemiology, Location-based Network Analysis, Web-based GIS, Human Movement Patterns and Disease Spread, GeoVisualization

EDUCATION

Ph.D, Geography
Minor in Spatial Epidemiology
University of Florida, USA

May. 2013

Dissertation Title: *“The role of the global air travel network in vector-borne disease connectivity and spread.”*

Abstract: The objective of this dissertation is to examine the role of the air travel network, specifically its flows and architecture, on the spread vector borne disease. The research aims to 1) provide quantifying metrics on how the air travel network connects airports all around the world. 2) Examine how network metrics and communities relate to malaria exportation and importation. 3) Design a Web-based GIS tool that can communicate the outputs of analyses to decision makers.

Advisor: Dr. Andrew J. Tatem, Emerging Pathogens Institute and Department of Geography
Co-chair: Dr. Timothy J. Fik, Department of Geography

GPA: 3.9

Master of Science, Geography
University of Florida, USA

Dec. 2009

Bachelor of Science, Land Resources Management
South China Agricultural University, China

Jun. 2007

ACADEMIC APPOINTMENTS

Postdoctoral Data Scientist
Center for Infectious Disease Dynamics and Department of Biology
Penn State University

May 2013 - Present

Alumni Fellow and Graduate Assistant
Department of Geography, University of Florida

August 2007 – May 2013

GRANTS, HONORS, AND AWARDS

I-cubed Program Interdisciplinary Research Project Awards (\$2500)	2012
NSF Student Travel Grant to ACM SIGSPATIAL (\$350)	2011
NSF Student Travel Grant to SSTD (\$1000)	2011
Departmental Travel Grant (\$1000 total)	2008, 2009, 2010, 2011
Student Paper Award of the AAG Business Geography Specialty Group (\$200 total)	2010, 2011
Departmental Teaching Award (\$100)	2010
Graduate Student Council Travel Grant (\$250)	2009
Alumni Fellowship (\$70000)	2007 -2011

PUBLICATIONS

Piel F., Williams T.N., Huang Z., Gupta S., Weatherall D.J. and Tatem A.J., Changing distribution of sickle haemoglobin worldwide. *Lancet Global Health*. (In press)

Huang Z., Kumar U., Bodnar T. and Salathe M. 2013. Understanding population displacements on location-based call records using road data. *MobiGIS, ACM SIGSPATIAL*. (In press)

Pindolia D.K., Garcia A.J., Huang Z., Smith D.L. and Tatem A.J. 2013. Network analyses of human and malaria movements by demographic attributes in East Africa. *Malaria Journal*. **12**:397.

Huang Z. and Tatem A.J. Global malaria connectivity through air travel. 2013. *Malaria Journal*. **12**:269.

Huang Z., Wu X., Garcia J.A., Fik T.J. and Tatem A.J. 2013. An Open-access Modeled Passenger Flow Matrix for the Global Air Network in 2010. *PLoS One*. **8**:e64317.

Sun J., Huang Z., Southworth J., and Qiu. Y. 2013. Mapping fractality during the process of deforestation in an Amazon tri-national frontier. *Remote Sensing Letter*. **4**:6.

Huang Z., Das A., Qiu Y. and Tatem A.J.. 2012. Web-based GIS: the Vector-Borne Disease Airline Importation Risk (VBD-AIR) tool. *International Journal of Health Geographics*. **11**:33.

Tatem A.J., Huang Z., Das A., Qi, Q., Roth J. and Qiu Y., 2012. Air Travel and Vector-borne Disease Movement. *Parasitology*. **139**:14.

PUBLICATIONS UNDER REVIEW

Tatem A.J., Huang Z., Kumar U., Pindolia, D., Qiu, Y., Kandula, D., Smith and D.L., The Use of Mobile Phone Call Record Data for Malaria Control and Elimination Strategic Planning in Namibia (*Lancet Global Health*).

Sun J., Huang Z., Zhen Q., Southworth J. and Perz S. Highlighting the spatial patterns of developed areas during the process of deforestation. (*Applied Geography*).

Pindolia D.K., Garcia A.J., Huang Z., Timothy J.F., Smith D.L. and Tatem A.J. Quantifying cross-border movements and migrations for guiding the strategic planning of malaria control and elimination (*Malaria Journal*).

OTHER PUBLICATIONS

Horby P., Tatem A.J., Huang Z., Gilbert M., Robinson T.P., Wint G.R.W., Hayden F.G., van Vinh Chau N., Shind, N., Carson G., Gao Z., Hongjie Y., Hay S.I. and Farrar J. (2013). H7N9 is a virus worth worrying about. *Nature*, 496(7446): 399.

Huang Z. and Kumar U. Combining call records and road data for strategic disaster response planning. *NetMob* 2013.

Tatem A.J., Huang Z., Kumar U., Pindolia, D, Kandula, D. and Lourenco, C. The Use of Mobile Phone Call Record Data for Malaria Control and Elimination Strategic Planning. *Netmob* 2013.

MEDIA REPORTS

Declan Butler. Mapping the H7N9 avian flu outbreaks. *Nature*. (<http://www.nature.com/news/mapping-the-h7n9-avian-flu-outbreaks-1.12863>).

Daisy Carrington. Breathe easy: Frequent flyer health tips. *CNN*. (<http://edition.cnn.com/2013/02/20/travel/business-travel-health-air-sars/index.html>).

Larry Greenemeier. Web Site Tracks Mosquito-Borne Diseases Spread Globally by Air Travel. *Scientific American*. (<http://blogs.scientificamerican.com/observations/2012/10/01/web-site-tracks-mosquito-borne-diseases-spread-globally-by-air-travel/>).

Larry Greenemeier. A New Tool Helps Airports Track Disease. *Scientific American*. (<http://www.scientificamerican.com/article.cfm?id=new-tool-helps-airports-track-disease>).

PUBLICATIONS IN PREPARATION

Huang Z. and Salathe M. Spatial Heterogeneity of Vaccine Sentiment.

Huang Z., Blackburn J and Qiu Y. Toward a New Framework for Data Management in Spatial Epidemiology: Identifying Public Health Programmatic and Operational Demands for Web GIS.

Tatem A.J.,Huang Z. and Falkner M., The Geography of Imported Malaria.

Tatem A.J. and Huang Z., Mapping and monitoring urban spatial dynamics in Africa using the Google Earth Engine.

Schramski S. and Huang Z., Spatial Social Network Analysis of Obstacles to Sustainable Development in the Eastern Cape, South Africa.

RESEARCH EXPERIENCES

Vaccine sentiment analysis from geo-tagged tweets
Data Scientist

Penn State University
May 2013 - Present

- Design and implement automatic bots to fetch geo-tagged tweets from the twitter streaming API.
- Utilize Apache Pig for data retrieval, Postgresql/PostGIS for spatial indexing and text tokenization.
- Use Amazon Turk for sentiment training, implement Naïve Bayesian algorithm for supervised classification, and utilize R/ArcGIS for geo-visualization.

Mobility of dengue cases and the implications for virus transmission
Data Scientist

Penn State University
Aug 2012 – Present

- Collect and geocoded GPS trajectories for the mobility analysis on dengue patients in Vietnam.
- Utilize spatial-temporal cluster algorithms to detect the activity clusters and stay points for patients.

Mapping and monitoring urban spatial dynamics in Africa using the Google Earth Engine

University of Florida
May 2012-May 2013

Lead Analyst

Funded by Google

- Project funding: \$25,000.
- Initiated the development of the African Population Database (AfriPop www.afripop.org) tool built using the Google Earth Engine with fusion table that will draw on the Landsat archive, satellite image classification tools and the existing AfriPop databases.
- Investigated the population transition, urbanization across Africa.

Population and malaria movements within Namibia and from Angola
Data Scientist and Analyst

University of Florida
May 2012-May 2013

Funded by the Clinton Health Access Initiative

- Project funding: \$75,000
- Inspected the cell phone travel records in Namibia and to investigate human and malaria infection movement patterns within Namibia and in-between Namibia and Angola.
- Performed trajectory analysis in a location-based social network to investigate the population movement from endemic area to non-endemic area and provide decision supports for evidence-based strategic planning for malaria elimination.

Vector-borne disease airline importation risk tool (VBD-AIR)

Lead Designer and Developer

University of Florida
2011- May 2013

Funded by the Transportation Research Board, National Academy of Sciences

- Project funding: \$250,000.
- Designed and developed the Vector-Borne Disease Airline Importation Risk Tool (VBD-Air <http://www.vbd-air.com>) to help better define the roles of airports and airlines in the transmission and spread of insect borne human diseases. A global modeled air travel database (<http://www.vbd-air.com/data>) was created.

Africa Infectious Diseases (AID) Research Program

University of Florida

Lead Designer and Developer 2010-2011

Funded by the Defense Threat Reduction Agency

- Project funding: \$80,000.
- Utilized the ASP.NET framework, SQL, and Google Map API to develop Africa Infectious Diseases (AID) database (<http://www.aid-bis.com/>).
- This database provided evidence-base for infectious disease trajectory checking in Africa.

TEACHING EXPERIENCES

Instructor, University of Florida 2009-2010

Course Name: GEA1000, Geography in the Changing World.

This course covers an overview in geography discipline, population change, GIS and remote sensing, deforestation, globalization, etc.

Instructor, University of Florida, Spring 2011

Course Name: GIS4001C and GIS5008C, Map and Graph.

This course covers the topics on desktop mapping techniques (ArcGIS) and interactive web map design.

Instructor, University of Florida, Fall 2011

Course Name: GEO3602, Urban Geography / Business Geography.

This course covers the topics on GIS application on urban geography and business geography.

COMPUTER SKILLS

Programming Languages: Hadoop, MVC framework, C#, Java, Python, SQL, JavaScript/Jquery, C++

Mathematical/Statistical Software: SAS, R

GIS software: ArcGIS, ArcObjects, Google Map API, OpenLayers, Web GIS Services

PEERED REVIEW REPORT

Tatem A.J. Huang Z., Das A., Qi, Q., Roth J. and Qiu Y. (2012). Air travel and vector-borne disease movement.

GOVERNMENT INTERNAL REPORT

Blackburn J.K., Huang Z., Qiu Y., Perkins D. and Davenport G. (2010). The Africa infectious disease bibliographic information system (AID-BIS).

CONFERENCE PRESENTATIONS

Huang Z and Tatem A. (2013). Global malaria connectivity through air travel, *Annual Meeting of American Society of Tropical Medicine and Hygiene*, Washington D.C.

Huang Z, Kumar U, Bodnar T, Salathé M (2013). Understanding population displacements on location-based call records using road data. *MobiGIS 2013, ACM SIGSPATIAL*, Orlando, Florida.

Huang Z and Salathé M. (2013). Location-based social network for disease surveillance. 2nd *International Conference on Digital Disease Detection*, San Francisco, California.

Huang Z and Kumar U (2013). Combining call records and road data for strategic disaster response planning. *NetMob 2013*, Boston, Massachusetts.

Huang Z, Wu X, Garcia JA, Fik TJ and Tatem AJ (2013). An Open-access Modeled Passenger Flow Matrix for the Global Air Network in 2010. *Annual Meeting of the Association of American Geographers*. Los Angeles, California.

Huang Z, Das A, Qiu Y and Tatem AJ (2012). Web-based GIS design for the vector-borne disease airline importation Risk (VBD-Air) Tool, Emerging Pathogens Institute Research Day, 2012, University of Florida.

Pindolia DK, Huang Z, Kumar U, West W and Tatem AJ (2012). Malaria elimination: the implications of population movements in Namibia, Emerging Pathogens Institute Research Day 2012, University of Florida.

Huang Z, Das A, Tatem AJ, Qiu Y (2012). Integrations of spatial knowledge into an organization: setup and control of data flow. *Annual Meeting of the Association of American Geographers*. New York City, New York.

Huang Z (2011). CLOUD-SOLAP: a simple distributed analytical framework for enhancement of decision making in business geography, *Annual Meeting of the Association of American Geographers*. Seattle, Washington.

Huang Z, Das A, Tatem AJ, Qiu Y (2011). Web-based GIS Design for the Vector-Borne Disease Airline Importation Risk (VBD-Air) Tool. *Southeastern Division of the Association of American Geographers*. Savannah, Georgia.

Huang Z (2011). Towards a better data management strategy for spatial epidemiology: An analytical database prototype with GIS on Service Orientated Architecture. *The 47th Annual Meeting of Florida Society of Geographers*. Gainesville, Florida.

Huang Z, Qiu Y, Perkins D, Davenport G, Blackburn JK (2010). Integrating geospatial knowledge into bibliographies: an example from the Africa Infectious Disease Bibliographic Information System (AID-BIS). *Annual Meeting of Southeastern Division of the Association of American Geographers*. Birmingham, Alabama.

Huang Z (2010). Using Participatory GIS as a marketing survey tool: an internet GIS framework by ESRI Flex API and ArcGIS Server. *Annual Meeting of the Association of American Geographers*. Washington D.C.

Huang Z (2010). A Participatory GIS Framework on Surveying by SQL Server and Bing Map API. *The 46th Annual Meeting of Florida Society of Geographers*. Tampa, Florida.

Huang Z (2009). Understanding urban landscape of housing with real estate submarkets: A spatial expansion model approach, *Annual Meeting of Southeastern Division of the Association of American Geographer*, Knoxville, Tennessee.

Huang Z (2009). Location value signature and externalities in an urban environment. *Annual Meeting of the Association of American Geographers*. Las Vegas. Nevada.

Huang Z and Fik T (2009). Location value signature and externalities in an urban environment. *The 45th Annual Meeting of Florida Society of Geographers*. St. Augustine, Florida.

INVITED TALKS

Huang Z. Geospatial technology in disease surveillance (Jan 2014), The Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China.

Huang Z. Disease spread through air travel network (Dec 2013). Institute of Respiratory Disease, Guangzhou, China.

Huang Z. Big data, GIS and infectious disease (Dec 2013). University of Hong Kong, Hong Kong.

ACADEMIC OUTREACH

Geo-tagged Tweet Seminar (Eventbrite [link](#)) 2013
Machine Learning Meetup (Eventbrite [link](#)) 2013

MEMBERSHIPS/AFFILIATIONS

The Human Mobility Mapping Project
Association of American Geographers
South Eastern Division of the Association of American Geographers
Association of Florida Society of Geographers
ACM SIGSPATIAL Group

REFERENCES

Dr. Andrew Tatem Reader Department of Geography University of Southampton Email: andy.tatem@gmail.com Phone: (023) 8059-2975	Dr. Marcel Salathé Assistant Professor Center for Infectious Disease Dynamics Department of Biology Penn State University Email: salathe@psu.edu Phone: (814) 867-4431	Dr. Alan MacEachren Professor Department of Geography Penn State University Email: maceachren@psu.edu Phone: (814) 867-9373
Dr. Peter Waylen Professor Department of Geography University of Florida Email: prwaylen@ufl.edu Phone: (352)-392-0494		