

HONGBING ZHANG

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EDUCATION

University of Minnesota, Twin Cities, MN

M.S., Transportation, Civil Engineering, fall 2007.

Thesis: "Evaluating Alternative Freeway Safety Improvements"

Purdue University, West Lafayette, IN

M.S., Atmospheric Science, Earth & Atmospheric Sciences, Dec. 2004.

Thesis: "Rapid Deployment Measurements of GPS Integrated Water Vapor during the IHOP 2002 Campaign"

Tsinghua University, Beijing, P. R. China

M.S., Geodesy and Survey Engineering, Civil Engineering, July 1999.

Thesis: "Research of Algorithms for Attitude Determination by using Global Positioning System/ Global Orbiting Navigation Satellite System (GPS / GLONASS)"

Zhengzhou Institute of Surveying and Mapping, ZhengZhou, P. R. China

B.S., Geodetic Engineering, July, 1988.

RESEARCH EXPERIENCE

Transportation, Dept. of Civil Engineering, University of Minnesota, Twin Cities, MN

Research Assistant, June 2005 – August 2007

- | Working on a crash prevention project in the I94W/I35W commons near downtown of Minneapolis, Minnesota.
- | Developed a methodology to evaluate the proposed geometric improvements on freeways by using Microscopic simulator AIMSUN NG.
- | Developed traffic data processing engine by using Visual Basic for Applications (VBA).
- | Developed a Python module for automatically importing traffic states into AIMSUN NG.
- | Proposed safety surrogate for evaluating geometric improvements on freeways.
- | Developed Plugin/APIs for AIMSUN NG to extract safety surrogate measures by using C++ and QT.

Atmospheric Science, Dept. of Earth & Atmospheric Sciences, Purdue University, West Lafayette, IN

Graduate Research, Aug. 2002 - Oct. 2004

- Processed and analyzed various weather sensors' data for an International Water Vapor Project sponsored by NOAA, named as IHOP2002.
- Developed a rapid deployment technique based on Real Time Kinematic GPS (RTK) method to retrieve integrated water vapor.
- Developed a package to perform water vapor data interpolation, statistical analysis and plot comparison by using FORTRAN and GMT on Linux platform.

GPS Application Research Division, Wellfound Technology Inc., Beijing, P. R. China

Senior Engineer, July 1999 - Dec. 2000

- | GPS real time kinematic (RTK) positioning application and software development.
- | Real-time GPS monitoring system for civil engineering.
- | GPS applications in timing and synchronization.

Institute of Geospace Information, Tsinghua University, Beijing, P. R. China

Research Assistant, July 1997 - July 1999

- Proposed an algorithm for integrating GPS/GLONASS to determine the attitude of GPS/GLONASS Multi-antenna array.
- Developed an innovative method to increase sensitivity of detecting GPS phase gross bias and repairing cycle slips which frequently occurred in high noise and dynamic environments.

Developed software for six research projects:

- | GPS auto-navigation system applied to the spraying of pesticides.
- | FM sub-carrier Radio Data System (RDS) / Differential GPS.
- | GPS monitoring system for Humei Bridge, Humen, P. R. China.
- | Tsinghua Real Time Kinematic (THRTK) post-processing software.
- | Tsinghua Attitude Determination Software (THADS).
- | Beijing Optical Instrument Factory GJS series of GPS receivers.

Beijing Academy of Surveying and Mapping, Beijing, P. R. China

Geodetic Engineering Group Leader, Engineer, July 1988 - Sep. 1996

Completed and supervised more than 20 Survey Engineering projects in the following areas: Geodetic Control Survey, Cadastral Survey, Topographic Survey, Construction Staking, Computer Aided Mapping, Digital Mapping, GPS Surveying, and Geographic Information System (GIS) Application.

COMPUTER SKILLS

| **Program languages:**

Assembly, Basic, C/Bash shell script on Linux, C/C++, FORTRAN, Python, Visual C++ and Visual Basic for Applications (VBA).
SQL Database Language.

| **Application software:**

Traffic simulators: AIMSUN, VISUM, VISIM, Paramics, and their SDK/APIs, Synchro *etc.*
Statistical software: SAS package and R language
Mathmatic softwares: Matlab, MathCAD and Maple.
Video Processing: Videopoint, Virtual Dub and its script.
GPS Research Analysis and Commercial Application Software.
GIS Package (MapInfo), Digital Mapping Software.

| **Operating Systems:**

DOS, UNIX / Linux, Windows NT / 95 / 2000/XP.

AWARDS

- Student Travel Grant, Center for Transportation Studies (CTS), University of Minnesota, Twin Cities, 2006.
- Purdue Research Foundation (PRF) research grant, Purdue University, West Lafayette, 2003.
- M.S. Honor Thesis Award, 1999, Tsinghua University, Beijing, P.R.China.
- Excellent Student Award, 1984-1988, Zhengzhou Institute of Surveying and Mapping, Zhengzhou, P. R. China.

AFFILIATIONS

- Transportation Research Board
- Institute of Transportation Engineers
- American Meteorological Society

SELECTED PUBLICATIONS & PRESENTATIONS

- 1 **Zhang, Hongbing**; Ge, Maorong; Guo, Jingjun. The Principle of GPS Attitude Determination and Software Design, *Bulletin of Surveying and Mapping*, **1999**, No 12, 27-30.
 - 1 Lin, Yanying; **Zhang, Hongbing**. the Important Improvements in GPS by USA in the Future, *Aircraft Engineering*, **1999**, Vol. 8, 36-38.
 - 1 Guo, Jingjun; **Zhang, Hongbing**. GPS/GLONASS Attitude Determination Algorithm and Software Design, *Annual GPS Meeting in P.R.China*, **2000**, 206-209.
 - 1 Guo, Jingjun; Ge, Maorong; **Zhang, Hongbing**. GPS Attitude Determination Algorithm and Its Software for Spacecraft Applications, *Journal of Tsinghua University*, **2000**, No. 6, 99-102.
 - 1 Wang, Lihua; **Zhang, Hongbing**; Zhan, Yonggen. Design and Realization of a Timing and Information Processing System for Geodetic Astronomy, *Geotechnical Investigation & Surveying*, **2000**, No. 5, 49-51.
 - 1 Haase, J.S.; **Zhang, H.**; Calais, E.; Cai, H.; and Ge, M. Constraints on horizontal humidity field variations in the Great Plains, USA, from GPS, in EGS-AGU-EUG Joint Assembly, pp. Abstract EAE03-A-07117, Nice, France, 2003.
 - 1 Haase, J.S., **Zhang, H. ***; Calais, E. Mobile GPS measurements of integrated water vapor as a potential tool for severe weather targeted observations, in Midwest Extreme and Hazardous Weather Regional Conference, pp. 1-6, AMS, Champaign, IL, 2003 (***Oral presenter**).
 - 1 **Zhang, H.**, Hourdos, J. and Michalopoulos, P. Evaluating Freeway Geometric Safety Improvements, in preparation
 - 1 **Zhang, H.**, Michalopoulos, P. Comparison of Estimated Time Varying Origin Destination Matrices from Integrated Planning/Micro-simulation Packages, in preparation
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