

Name: **Zhiyong Wang**

Gender: Male

Date of Birth: Jan. 02, 1984

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Education

Sep. 2003 – **Northeastern University, Shenyang, China**

Jul. 2007 Bachelor of Engineering degree in Automation.

Sep. 2007 – **Tongji University, Shanghai, China**

Jun. 2010 Master of Engineering degree in Control Theory and Control Engineering.

Oct. 2010 – **Delft University of Technology, Delft, The Netherlands**

June. 2015 PhD researcher

June. 2015 – **Delft University of Technology, Delft, The Netherlands**

present Post-doc researcher

Research Disaster Management; Artificial Intelligence; Agent technology; Navigation, Spatial data management systems

Interests Intelligent Algorithms; Operations Research; Geographic Information System, Traffic incident management

Experience

Sep. 2006- **Design of Electronic oven Temperature Control System based on Fuzzy Logic Control**

- Oct. 2006
- Used PLC as a slave computer to accomplish the detection, data-collection and control of the controlled objects, and implemented the supervision of the controlled objects and slave computers in a master computer.
 - Achieved the communication of master and slave computers through RS232 serial interface.
 - Embedded fuzzy logic controller into the application program of KingView by combining Matlab and VB.

Nov. 2006- **Design and Simulation of an Arc Furnace Electrode Control System based on Model-free Adaptive Control**

- Jun. 2007
- Analyzed the nonlinearity and arc length disturbance of single-phase electrode regulator system of arc furnace and built the simulation model in Matlab/Simulink.
 - Designed a MFAC-PID controller to enhance the robustness and anti-jamming capability of the control system.

Sep. 2007- **Modeling and Dynamic Simulation of Cooling Water Systems of Shanghai Synchrotron Radiation Facility**

- Dec. 2007
- Implemented the mathematical model of plate heat exchangers in Matlab/Simulink.
 - Used Matlab/Simulink to simulate cooling water systems with traditional PID control scheme.
 - Designed a fuzzy logic controller for sub-systems of linear accelerator to control the temperature of cooling water with high accuracy.

Dec. 2007- **Research on Network Control Systems and Network Congestion Control Model of BACnet**

- Sep. 2008
- Described the network loaded identity as a fuzzy finite state machine (FFSM) model.
 - Proposed a new congestion control algorithm based on traditional Random Early Detection (RED) mechanism and the FFSM restriction.
 - Simulated the FuSM model and the proposed algorithm using Matlab/Simulink and Network Simulator2(NS2) to demonstrate the effectiveness of the our approach.

Sep. 2008- **Study on Transportation Model of Large-scale Emergency Relief Commodities and Vehicle Routing Problem (Project of National Natural Science of Foundation of China)**

- Jun. 2010
- Established a non-cooperative game model for the resource allocation in a multi-emergency scenario.

- Designed an improved ant colony optimization algorithm to calculate Nash equilibrium of the game.
- Developed an integrated multi-objective model for determining the optimal rescuing paths after earthquake and a hybrid algorithm to obtain the Pareto solutions

Oct. 2010-
Jun. 2011 **Study on Decision Making in Crisis Management**

Jun. 2011-
present **Research on navigation for first responders**

- Awards**
- Departmental Scholarship, Northeastern University, 2003-2007
 - Scholarship Class A, Tongji University, Jun. 2007, Jun. 2008
 - 3rd place of the 5th National Graduate Mathematical Contest in Modeling, Dec. 2008

- Research grants**
- COST Action TU0801 "Semantic Enrichment of 3D City Models for Sustainable Urban Development", 2012
 - China Scholarship Council scholarship, 2010-2014
 - Grant from Rijkswaterstaat, Ministry of Infrastructure and the Environment, the Netherlands, 2015

- Publications**
- Zhiyong Wang, Xu Han, Weisheng Xu, Jijun Yang, "Solving Nash Equilibrium based on Improved Ant Colony Algorithm," *Computer Engineering*, (Chinese core journal), 2010, 36(14). 166-168
 - Zhiyong Wang, Jijun Yang, Weisheng Xu, Jiazhen Peng, "A Game Theoretic Approach for Resource Allocation based on Ant Colony Optimization in Emergency Management," in *Proc. IEEE International Conference on Information Engineering and Computer Science*, (ICIECS2009), vol.01, pp.147-150, Dec. 2009.
 - Jie Zhang, Zhiyong Wang, Weisheng Xu, Dan Xiong, "The modal and solution of rescue path selection in emergency," *Application Research of Computers*, (Chinese core journal), 2011, 28(4). 1311-1314
 - Jie Zhang, Zhiyong Wang, Weisheng Xu, Jijun Yang, "Scheduling model and solution of relief resources for emergencies, (Chinese core journal), 2011, 47(31). 220-223
 - Wang, Z., & Zlatanova, S. (2013). Taxonomy of navigation for first responders. In *Progress in Location-Based Services* (pp. 297-315). Springer Berlin Heidelberg.
 - Wang, Z., & Zlatanova, S. (2013). An A*-based search approach for navigation among moving obstacles. In *Intelligent Systems for Crisis Management* (pp. 17-30). Springer Berlin Heidelberg.
 - Wang, Z., & Zlatanova, S. (2013, November). Multi-agent Infrastructure Assisting Navigation for First Responders. In *Proceedings of the Sixth ACM SIGSPATIAL International Workshop on Computational Transportation Science* (p. 1-6). ACM.
 - Wang, Z., Zlatanova, S., Moreno, A., van Oosterom, P., and Toro, C. (2014). A data model for route planning in the case of forest fires. *Computers & Geosciences*, 68:1-10
 - Wang, Z., & Zlatanova, S. (2016). Multi-agent based path planning for first responders among moving obstacles. *Computers, Environment and Urban Systems*, 56, 48-58.
 - Wang, Z., Zlatanova, S., and Steenbruggen, J. (2016). Traffic incident management in the presence of hazards. In *International Conference on Vehicle Technology and Intelligent Transport Systems*. submitted.
 - Wang, Z. and Zlatanova, S. and Steenbruggen J. (2015). Integration of traffic information into the path planning among moving obstacles. *International Journal of Geographical Information Science*. under review
 - Wang, Z., Zlatanova, S., and van Oosterom, P. (2015). Path planning for first responders among uncertain moving obstacles. manuscript under preparation

MSc thesis

topic **Modeling and Solution of the Allocation of Large-scale Emergency Relief Commodities**

- Established a non-cooperative game model for the resource scheduling in emergency management.
- Designed an improved ant colony optimization algorithm to obtain Nash equilibrium of the game.
- Developed a multi-objective model for determining the optimal rescuing paths after earthquake.

- Proposed a genetic hybrid algorithm to obtain the Pareto solutions
- Incorporated the algorithm with other learning techniques to find multiple Nash equilibriums.

PhD project topic Path planning for first responders in the presence of moving obstacles

- Developed a multi-agent system, which supports the spatial data processing and analysis involved in the routing process.
- Designed algorithms for path planning in the presence of moving obstacles
- Developed spatial data models, which structure the disaster-related information for routing

Skills • Computer Skills: C/C++, Java, JavaScript, HTML, XML, Matlab/Simulink and MS Office