# YU WANG

In Tech We Trust

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## Summary

- Expert in applying analytics to solve real-world business problems
- Experienced technical lead and project manager with excellent interpersonal skills
- Skilled software developer and architect. Proficient in multiple programming languages, libraries, and tools

## Professional Experiences

### Walmart Inc.
Bentonville, AR

PRINCIPAL DATA SCIENTIST  – *Leverage advanced analytics to optimize supply chain of Walmart US*  —  *Apr 2018 - Present*

- **Delivery Window Optimization**
  - Optimized store delivery time window from >12hrs to ~4hrs, so to save staffing cost while maintaining high LOS
  - Considered multiple constraints : CVRPTW, demand splitting, workload balancing, DOT rules and local laws
- **Store-to-DC Alignment Optimization**
  - Created a web-app to support DC-to-store alignment, with goals of minimizing transportation cost and avoiding unnecessary / undesired impacts. (Model: *C++, CPLEX, Python*, UI: *Python [Django], JavaScript [RequireJS, D3.js]*)
- **Return Decision Module (RDM)**
  - In charge of middle-ware of RDM – a decision support tool that helps handle the merchandise return in the most economical way. (*Java [Tomcat, Spring, Camel, ActiveMQ, Jersey, Guice, Dozer], SQL [DB2, SQL Server, TeraData]*)

### CSX Transportation Inc.
Jacksonville, FL

SR. MANAGER OF OPERATIONS RESEARCH  – *Dedicated to creating decision support tools for railroads*  —  *Mar 2012 - Apr 2018*

- **Train Planner**
  - Combined optimization, data-mining, and simulation to create a web-based decision support tool to schedule / simulate / visualize the meet-and-pass (time & location) of line-of-road trains
  - Used widely by multiple departments of CSX – Service Planning: test and evaluate new plans; Engineering: find proper time windows for maintenance; Network operation: perform capacity and impact analysis, etc.
- **Line-of-road Emulator**
  - Created a web-based tool to identify network bottlenecks and to evaluate impacts of trains by dynamic visualization. Developed data preloading and caching modules to improve the running efficiency and user experiences
  - Provided two levels of view to monitor train movements on a GIS map
    * *Macro view overlooks the whole network*. It animates trains as moving dots, finds and marks out problematic ones (e.g., slow). It was used to illustrate to executive team and board members how congestion happened on the northern tier corridor in 2014 winter, which received high appreciation and won CSX Spotlight award
    * *Micro view focuses on local*. It shows trains as moving strips, which enables users observing more details en route. It was used to analyze the blockage to road traffic in Elsdon, IL to dispute the accusation from TRB
- **Hump Yard Simulation System (HYSS)**
  - Project manager. Developed data feeding module. Designed and performed statistical tests to validate output of HYSS, which consists of 6 hump yard models simulating their processes on receiving, classifying and departing
  - Assisted network modeling team using HYSS to perform various what-if analysis and to make strategic and tactical decisions (e.g., planning track utilization and right-sizing of yard resources)

### COFCO Group
Beijing, China

SOFTWARE ENGINEER  – *Designed and Developed J2EE-based web-apps*  —  *Jul 2003 – Jul 2005*

- **Agricultural Information Subscribing Platform**
  - Developed an information providing system that allows users subscribing agricultural information via cellphone short-messages (collaborative project between COFCO, CCTV-7 and China National Radio)
- **Employee Satisfaction Survey System**
  - Designed and developed a web-based survey system for COFCO HR. Used in 2005 and 2006 at COFCO headquarter and its two subsidiaries (~500 employees involved)

# Education

- **Ph.D.**      Operations Research           University of Pittsburgh      Pittsburgh, PA    2011
- **M.S.**      Industrial Engineering         University of Pittsburgh      Pittsburgh, PA    2007
- **M.S.**      Mechanical Engineering       Tsinghua University         Beijing, China    2003
- **B.S.**      Mechanical Engineering       Tsinghua University         Beijing, China    2000

# Technical Skills

### ANALYTICS

- **AI / ML**    Supervised [**Regression, DT, NN, CNN, RNN, SVM**], Clustering [**k-means, DBSCAN**], Reinforcement [**DQN, A3C**]
- **Optimization**    MILP [**CPLEX, Gurobi**], Heuristics [**Local Search, Simulated Annealing, Tabu Search**]
- **Simulation**    Agent-based [**AnyLogic, RePast**], Discrete-event [**Arena, Simio**]
- **Miscellaneous**    DL Framework [**PyTorch, Tensorflow**], Big data [**Spark, Hadoop**], Statistics [**R, SAS, Minitab**]

### PROGRAMMING LANGUAGES & TOOLS

- **Python**    AI / ML [**Scikit-learn, Pandas**], Computer Vision [**OpenCV**], Network Analysis [**Networkx**], Web [**Django, Flask**]
- **Java**    Web [**J2EE/JSP, Tomcat**], Framework [**Spring, Struts, Camel, ActiveMQ, Jersey, Guice, Hibernate**]
- **C++/C**    Library [**STL, SWIG**], IDE [**Visual Studio, Eclipse CDT**]
- **JavaScript**    Web[**jQuery, NodeJS**], Visualization [**D3.js, Highcharts, Bootstrap**], MVVM [**RequireJS, AngularJS**]
- **Database**    RDBMS [**MS SQL Server, Oracle, DB2, PostgreSQL, MySQL, TeraData**], Geography [**ArcGIS, QGIS, PostGIS**]
- **Miscellaneous**    Tableau, VB/VBA/Basic, Delphi/Pascal, Fortran, Matlab, Shell (Unix/Linux)

# Professional Contributions

### SELECTED PAPERS (FIRST-AUTHOR ONLY)

- **Yu Wang**, K. Louis Luangkesorn, and Larry Shuman. "Modeling emergency medical response to a mass casualty incident using agent based simulation." *Socio-Economic Planning Sciences* Vol.46, No.4, p281-290, 2012
- **Yu Wang**, Louis Luangkesorn, and Larry J. Shuman. "Best-subset selection procedure." In *Simulation Conference (WSC), Proceedings of the 2011 Winter*, p4310-4318, IEEE, 2011.
- **Yu Wang**, Haiyan Zhao, Su Wu, et al. "Establishment of segmented moving double ellipsoid heat source model in electron beam welding numerical simulation." *Chinese Journal of Mechanical Engineering*, Vol.40, No.2, p165-169, 2004
- **Yu Wang**, Su Wu, Haiyan Zhao, et al. "An investigation on the shape parameters of double ellipsoid heat source model in numerical simulation of high energy beam welding." *Transactions of the China Welding Institution*, Vol.24, No.2, p67-70, 2003

### PRESENTATIONS ON INFORMS ANNUAL CONFERENCES

- Train Planner. *Houston, TX*, 2017
- CSX Line-of-Road Simulation. *Nashville, TN*, 2016
- Development and Application of Line-of-road Emulator Tool in CSX. *Philadelphia, PA*, 2015
- Predict Congestion Status of a Hump Yard using Data-mining. *Minneapolis, MN*, 2013
- An Agent-based Simulation for Emergency Response Policy Evaluation & Selection. *Austin, TX*, 2010

# Honors & Awards

- Spotlight Awards    CSX Transportation Inc.    2015
- Graduate Scholarship    University of Pittsburgh    2005 - 2011
- Outstanding Master Thesis Award (One of 3 winners in 110 graduates)    Tsinghua University    2003
- GuangHua Scholarship for Academic Excellence - Prize I    Tsinghua University    2001
- Graduate with Honor    Tsinghua University    2000
- Excellent Student Scholarship    Tsinghua University    1996 - 1999