# Jianjiang Yang

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## EDUCATION

**Ph.D., Transportation Engineering** — University of Tennessee, Knoxville — May, 2015
**M.S., Statistics** — University of Tennessee, Knoxville — May, 2015
**B.S., Transportation Engineering** — Tongji University, Shanghai, China — June, 2011

## SKILLS & CERTIFICATE

**CFA Level 1 Candidate** (registered for Dec., 2015 exam)

**Statistical Modeling:** Regression, Classification, Clustering, Experiment Design, Multivariate Statistics, Categorical Data Analysis, Factor Analysis, Principal Component Analysis, Survival Analysis, Spatial Analysis, and Time-Series Forecasting etc.

**Programing Languages:** Python, R, Matlab, Perl, Visual Basic, and Shell Scripting

**Statistical Tools:** R, Matlab, Python (Numpy, pandas, matplotlib etc), Tableau, SAS, JMP, and SPSS

**Database:** SQL (SQL Server, MySQL, SQLite), and Access

**Others:** LaTeX, Markdown, VISSIM, Arena, VISUM, TransCAD, ArcGIS, QGIS

## EXPERIENCE

### *Postdoctoral Research Associate* — Oak Ridge National Laboratory
June, 2015 — Present

Transportation Planning and Decision Science Group, Center for Transportation Analysis

- **Freight Analysis Framework 4 (Funded By FHWA)**
  - Develop a freight estimation tool based on gravity and Iterative Proportional Fitting models to estimate OD flow movements for natural gas and crude petroleum;
  - Scrape and clean data from websites using BeautifulSoup, pandas, and NumPy etc.;
  - Perform geographic data analysis, data conversion, data management, and map automation using ArcPy;

### *Research Assistant* —Oak Ridge National Laboratory
Sept., 2013 — May, 2015

Transportation Planning and Decision Science Group, Center for Transportation Analysis

- **Non-Highway and On-Highway Gasoline Usage Models (Funded by FHWA)**
  - Led to develop nine models for estimating non-highway gasoline in private and public sectors, as well as on-highway gasoline use in public sector;
  - The results from these models are used by FHWA to distribute Highway Trust Fund to each state every year.
- **New Methodology for Estimating Fuel Economy by Vehicle Class and Fuel Type (Funded By FHWA)**
  - Developed a two-step approach to generate annual estimates of fuel efficiency (MPG) by vehicle class and fuel type for *Highway Statistics* annual publication.
- **Analyses of Survey-Based Data Products in Support of New York State (NYS) DOT (Funded by NYSDOT)**
  - Generated summary statistics on travel behaviors for NYS Metropolitan regions;
  - Analyzed and visualized travel behaviors and patterns of NYS elderly residents;
  - Studied travel behaviors and characteristics of NYS residents using logistic regression models.
- **Freight Analysis Framework 3.5 (Funded By FHWA)**
  - Generated provisional estimates of freight shipped to (imports), from (exports), and within (domestic) the United States.
- **Freight Facts and Figures Publication (Funded by FHWA)**
  - Created map visualization of the volume and value of freight flows in the United States.

### *Graduate Research Assistant* — University of Tennessee, Knoxville
Aug., 2011 — Sept., 2013

Intelligent Transportation Systems (ITS) Lab

- **TDOT Vehicle Probe Based Real-Time Travel Information Study (Funded By Tennessee DOT)**
  - Investigated patterns of spatio-temporal correlations between upstream and downstream traffic using times series techniques;
  - Developed a spatio-temporal Kriging prediction model that outperforms benchmark time series techniques; this work was recognized by four paper awards and media report several times;
  - Developed a spatio-temporal approach for high resolution traffic data imputation and it was proved to superior to existing methods with better imputation accuracy and flexibility.
- **Distributed Computation Framework for Faster-than-Real-Time Microscopic Traffic Simulation (Funded By ORNL)**
  - Collected and cleansed massive traffic data for simulation validation;
  - Collaborated to develop a faster-than-real-time traffic simulation system.
- **Airline Passenger Traffic Forecasting**
  - Performed forecasting on airline passenger traffic using lagged regression, exponential smoothing, decomposition, SARIMA, and dynamic linear regression methods.
- **Information-theoretic approach in kernel quadratic discriminant analysis**
  - Proposed a novel information-theoretic method to choose the best kernel function and parameters for quadratic discriminant analysis, the algorithm was implemented in Matlab.

***Graduate Research Assistant*** — **University of Tennessee, Knoxville** June, 2013 — Aug., 2013
Driving Simulator Lab

- **Driving simulator study on Driving Performance of early Alzheimer's Patients**
  - Recruited and tested early Alzheimer's patients driving performance using driving simulator;
  - Analyzed data records of experiment subjects to identify factors influencing driving performance of early Alzheimer's patients.

## SELECTED AWARDS AND HONORS

1st Place of Graduate Student Best Paper Award, Transportation Research Forum 2015
TSITE Student Scholarship Award, Tennessee Section of Institute of Transportation Engineers 2014
1st Place of Student Paper Competition, Tennessee Section of Institute of Transportation Engineers 2014
Runner-up of International Collegiate Traffic Bowl, Institute of Transportation Engineers 2014
The William Temple Scholarship Challenge Traffic Bowl, Southern District of ITE 2014
Champion of SDITE Traffic Bowl, Southern District of ITE 2014
National Motivational Scholarship, China Ministry of Education 2010

## MEDIA COVERAGE

"UT engineering student developing method of forecasting traffic", *WATE.COM*.
"Cloudy With a Chance of Slowdowns: Engineering Student Developing Traffic Forecasts", *Tennessee Today*.
"U.T. 2nd Place at Bowl in Boston!", *Tennessee Section Institute of Transportation Engineers -TSITE.org*

## PUBLICATIONS AND PRESENTATIONS (4 OF 10)

**Yang, J.** "A Spatio-Temporal Approach for High Resolution Traffic Flow Imputation," Transportation Research Forum 56th Annual Meeting, March 2015, Atlanta, GA.

**Yang, J.** "A Spatio-temporal based Algorithm for Short-Term Speed Prediction," Transportation Research Forum 56th Annual Meeting, March 2015, Atlanta, GA.

**Yang, J.** "Improve traffic forecasting accuracy by utilizing Spatial-Temporal Dynamics," Tennessee Section Institute of Transportation Engineers Summer Meeting, July 2014, Gatlinburg, TN.

**Yang, J.**, L.D. Han, P.B. Freeze, S.M. Chin, H. L. Hwang. "Short-Term Freeway Speed Profiling Based on Longitudinal Spatial-Temporal Dynamics," Transportation Research Record, 2014.