**K. Joseph Shrestha**

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# Education

## Ph.D. Candidate, Civil Engineering June 2013 – August 2016

Iowa State University, Ames, Iowa

Specialization: Construction Engineering and Management

Dissertation: Data-Analytics and Visualization to Improve Construction Cost and Schedule Certainty

Advisor: Dr. H. David Jeong

## M.S., Civil and Environmental Engineering January 2012 – May 2013

University of Nevada, Las Vegas, Las Vegas, Nevada

Specialization: Highway Safety

Thesis: Investigation of Crashes and Identifying the Best Practices for Setting up Speed Zones in Towns Along Rural Highways in Nevada

Advisor: Dr. Pramen P. Shrestha

## B.E., Civil Engineering August 2005 - May 2010

Tribhuvan University, Institute of Engineering, Lalitpur, Nepal

Senior Project: Survey and Design for RCC Bridge Construction at Kshitiz Nagar, Koteshwor

Advisor: Suresh Kumar Regmi

# Summary of Qualifications

* Experience with data mining techniques such as artificial neural network and decision trees
* In-depth knowledge of construction engineering and project management
* Lead and assistant student investigator in federal and state projects
* Successful research proposal writing experience
* Teaching experience as an instructor and teaching assistant
* Knowledge of computer programming such as VB.NET, VC#, and Python

# Research Interest

* Big data analytics and data visualization to construction problems
* Geographic Information Systems (GIS) applications to advanced project decision making
* Advanced technologies in construction
* Construction cost and schedule estimation
* Construction market trends
* Construction safety

# Research Experience

## Graduate Research Assistant June 2013 – Present

## Data Analytics and Laboratory for Project and Infrastructure Management, Iowa State University

* Developed framework for advanced daily work report system
* Developing advanced methodology to determine highway construction index
* Formulated artificial neural network, decision tree, and multiple regressions for preconstruction cost estimation
* Designed, distributed, and analyzed three nationwide surveys
* Conducted on-site and phone interviews of state DOT representatives
* Organized and conducted a vetting workshop
* Assisted for successful grant proposals writing
* Reviewed 6 journal papers Jfor ASCE Journal of Construction Engineering and Management and one conference paper for Construction Research Congress
* Mentored 4 PhD and Masters students in conducting research

## Graduate Research Assistant January 2012 – May 2013

## University of Nevada, Las Vegas

* Conducted survey with state DOTs about their current practices of setting up speed zones
* Developed binary and multinomial logistic regression models for crash data analysis
* Collected spot speed and road characteristics data on-site and analyzed the data
* Conducted phone interviews with Nevada DOT district traffic engineers
* Mentored 4 Masters students in conducting research

## Research Projects (Lead Student Researcher)

* MDT: 8232-001 (2015-2016), “Advanced Methodology for Highway Construction Cost Index,” Montana Department of Transportation, Research project value: $152,463.
* MATC-ISU: 238 (2013 – 2015), “Framework for Advanced Daily Work Report System,” Mid-America Transportation Center, Research project value: $55,793.
* P255-11-803 (2012-2013), “Preparing Guidelines for Speed Reduction in Towns along Rural Highways,” Nevada Department of Transportation, Research project value: $106,261.

## Research Projects (Assisted)

* NCHRP 15-51 (2013-2015), “Pre-construction Services Cost Estimating Guidebook,” National Corporative Highway Research Program, $425,000 – developed top-down cost estimation models to estimate preconstruction costs.
* MDT: 8227-001 (2015-2016), “Top-down Construction Cost Estimating Model/Guide Using a Neural Network within an Off-the-Shelf Spreadsheet and Database Program,” Montana Department of Transportation, $131,955 – performed initial data extraction and exploration for detailed analysis.
* Solar Decathlon (2013), U.S. Department of Energy, $200,000 – developed cost estimation template for the DesertSol house.

## Research Grant Proposal Experience

* MDT: 8232-001 (2015-2016), “Advanced Methodology for Highway Construction Cost Index,” funded by Montana Department of Transportation, Funding Amount: $152,463 - Developed draft proposal with background, problem statement, objectives, and research plan.
* Minnesota Department of Transportation, “Inflation Rate Differentials of Pavement Types Using Historical Construction Bid Data (Unfunded),”– Worked on objectives, research methodology, and tasks.
* “Advanced Methodology to Determine Highway Construction Cost Index,” Midwest Transportation Center (Unfunded) – Developed draft proposal with problem statement, research approach and methods, task description, expected results and products, discussion of pertinent completed research and related research in progress.
* “Effective Production Rate Estimation and Monitoring of Controlling Activities using Daily Work Report (DWR) Data (Preparing),” Montana Department of Transportation – Developed research needs statement, writing details for several tasks.

## Research Workshops (Attended)

* How to Write Successful CAREER Grant Proposal, Office of the Vice President for Research/Grants Hub by Drs. Basak Ganapathysubramanian, Andrew Miner, Aditya Ramamoorthy, and Maria Salas-Fernandez, February 5, 2014.
* Writing Winning Grant Proposal Workshop by John Robertson at Iowa State University, October 3, 2013.
* Preparing a Paper for Publication Workshop, University of Nevada, Las Vegas, April 5, 2013
* External & Internal Funding Resources, GPSA Funding Workshop by Dr. Daniel Benyshek, Associate Professor, University of Nevada, Las Vegas, October 12, 2012.

## Journal and Conference Manuscript Reviewer

* ASCE Journal of Construction Engineering and Management, reviewed 7 manuscripts, January 2015 – Present
* ASCE Construction Research Congress (CRC), reviewed 2 papers, June, 2015 – Present

# Publications and Presentations

## Referred Journal Publications

**Shrestha, K. J.**, and Shrestha, P. P. “Comprehensive Framework for Speed-Zone Guidelines.” *Elsevier Journal of Traffic and Transportation Engineering*. (In Press).

**Shrestha, K. J.**, and Shrestha, P. P. “Non-Geometric and Non-Personal Factors Associated with Crash Severities: A Case Study of 11 Towns along Rural Highways of Nevada” *Traffic Injury Prevention*. (Under Review).

**Shrestha, K. J.**, and Jeong, H. D. “As-Planned Construction Schedules Using Sequential Pattern Mining (SPM) and Social Network Diagram.” *ASCE Journal of Construction Engineering and Management*. (Under Review).

Jain, D., **Shrestha, K. J.**, and Jeong, H. D. “Spatiotemporal Visualization of Unit Prices of Major Cost Items of Transportation Projects Across Iowa Using Geographic Information Systems (GIS).” *ASCE Journal of Construction Engineering and Management.* (Under Review).

**Shrestha, K. J.**, Jeong, H. D., and Gransberg, D. D. “Enhanced Automation Framework for Collection and Utilization of Daily Work Report (DWR) Data.” *Automation in Construction*. (Under Review).

**Shrestha, K. J.**, and Jeong, H. D. “Automating DWR Data Analysis to Develop As-Built Schedules.” *ASCE Journal of Construction Engineering and Management*. (To be submitted).

**Shrestha, K. J.**, Rueda-Benavides, J., Craigie, E., Jeong, H. D., and Gransberg, D. D. “Holistic Approach for Preconstruction Cost Estimation.” *ASCE Journal of Construction Engineering and Management*. (In Preparation).

## Peer-Reviewed Conference Proceedings

**Shrestha, K. J.**, Jeong, H. D., and Gransberg, D. D. “Critical Analysis of Current Practices of Highway Construction Cost Index (HCCI) Calculation and Utilization.”2016 Construction Research Congress. San Juan, Puerto Rico. (Submitted).

**Shrestha, K. J.**, Jeong, H. D., and Gransberg, D. D. (2015). “Current Practices of Collecting and Utilizing Daily Work Report Data and Areas for Improvements.” The 6th International Conference on Construction Engineering and Project Management (ICCEPM 2015). October 11-13, 2015, Busan, Korea.

Jain, D., **Shrestha, K. J.**, and Jeong, H. D. (2015). “Spatiotemporal Analysis of Unit Prices of a Major Cost Item for Transportation Projects across Iowa Using Geographic Information Systems (GIS).” The 6th International Conference on Construction Engineering and Project Management (ICCEPM 2015). October 11-13, 2015, Busan, Korea.

**Shrestha, K. P.**, and Shrestha, P. (2015). “Framework Development of Speed Zone Guidelines based on Current Best Practices.” *Transportation Research Board: 93rd Annual Meeting*, Transportation Research Board, January 12-16, 2015, Washington, D.C.

Shrestha, P. P., Shrestha, K., and **Shrestha, K.** (2012). “Carbon Dioxide Emissions by the Transportation Sector in Kathmandu Valley, Nepal.” *Developing the Frontier of Sustainable Design, Engineering, and Construction*, American Society of Civil Engineers, November 7-9, 2012, Fort Worth, Texas, 90–97.

## Technical Reports

Gransberg, D. D., Jeong, H. D., Craigie, E., Rueda, J., and **Shrestha, J.** (2015). *Preconstruction Services Cost Estimating Guidebook*. Federal Highway Administration, Washington, D.C.

Jeong, H. D., Gransberg, D. D., and **Shrestha, K. J.** (2015). *Framework for Advanced Daily Work Report System*. Mid-America Transportation Center.

Shrestha, P. P., Said, A., Tian, Y., and **Shrestha, K. P.** (2013). *Guidelines for Speed Reduction in Towns along Rural Highways*. Nevada Department of Transportation.

## Presentations

**Shrestha, K. J.**, and Jeong, H. D. (2015). “Enhanced Framework for Better Collection and Utilization of Daily Work Report Data.” 2015 Mid-Continent Transportation Research Symposium. Iowa State University, Ames, Iowa.

Jeong, D. H., and **Shrestha, K. J.** (2015). “As-Built Schedule Development based on Daily Work Report Data.” US-Korea Conference 2015. Atlanta, GA. (Invited)

**Shrestha, K. J.**, and Jeong, H. D. (2014). “Using Web Scraping Technology to Automatize Cost Data Collection for Calculating Construction Cost Indexes.” 1st Graduate and Professional Student Research Conference, Iowa State University, Ames, Iowa.

Jain, D., **Shrestha, J.**, and Jeong, D. (2014). “Spatiotemporal Visualization of Major Cost Items in Highway Construction in Iowa.” Civil and Construction Software Club Technology Fair. Iowa State University, Ames, Iowa. (Invited)

**Shrestha, K. J.**, and Jeong, H. D. (2014). “DWR Based As-Built Schedule –Powerful But Highly Neglected Application of DWR Data.” CCEE Graduate Student Research Showcase and Poster Competition. Iowa State University, Ames, Iowa.

**Shrestha, K. P.**, and Jeong, D. (2013). “Big Data, Predictive Analytics, and Data Visualization in Construction Engineering.” CCEE Graduate Student Research Showcase and Poster Competition. Iowa State University, Ames, Iowa.

**Shrestha, K. P.**, and Shrestha, P. (2013). “Investigation of Crashes and Identifying the Best Practices for Setting up Speed Zones in Towns Along Rural Highways in Nevada.” College of Engineering: Graduate Celebration, University of Nevada, Las Vegas, Las Vegas, Nevada.

# Teaching Experience

## Instructor, Iowa State University Fall 2015

CONE 381/481 – Bidding Construction Projects I

Average course evaluation rating from students: 4.15 (scale 1 – 5, 5 being excellent)

* Updated syllabus and developed additional course materials
* Instructed construction cost estimation for horizontal construction
* Coordinated with the highway industry mentors and Iowa DOT representatives to allow students to bid on actual projects
* Guided students to develop and submit competitive bid as representatives of contractors
* Graded assignments and final project documentation
* Managed course materials and grades on Blackboard

## Teaching Assistant, Iowa State University Fall 2014

CE 503 – Construction Finance and Business Management

* Guest lecture on cash flow analysis
* Assisted with management of course material on Blackboard
* Revised assignment material and graded completed assignments
* Face-to-face student interaction

CE 595 – Research Methodologies in Construction Engineering

* Guest lecture on questionnaire survey development

## Teaching Assistant – University of Nevada Las Vegas Spring 2012

CEM 150 (Fundamentals of Construction Science), CEE 198 (Ethics and Professional Practice of Engineering), CEE 298 (Project Management and Professional Practice), CEE 499 (Fundamentals of Engineering Examination Registration)

* Prepared assignments and final exam questions
* Graded assignments
* Coordinated with guest lecturers
* Assisted students in office hours
* Managed Construction Management Computer Lab

## Teaching and Mentoring Activities

* Mentored five undergraduate students in Engineering Mentorship Program, August 2013 – May 2014.
* Mentored three master students for submitting peer reviewed journal papers and assistance with thesis
* Industry Advisory Panel (IAC) Meeting, Iowa State University, April 23, 2015
* Preparing for Future Faculty, Iowa State University, Fall 2015

## Specialty Courses Taken

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| --- | --- |
| **Data Mining Courses**   * Introduction to Database Management System * Statistical Analysis * Knowledge Discovery and Data Mining * GIS Programming and Automation * Software Tools for Large Scale Data Analysis | **Construction Courses**   * Research Methods in Construction Engineering * Preconstruction Project Engineering and Management * Construction Project Engineering and Management * Project Risk Management * Construction Finance and Business Management * Construction Estimating * Design of Construction System |

# Industry Experience

## Civil Engineer June 2010 – December 2011

Softwel (P) Ltd., Nepal

* Performed road alignment survey, design, and cost estimation
* Trained clients to use various software developed in-house
* Developed district water supply, sanitation, and hygiene management information system
* Built pump selection software to choose varieties of pump brand, series, and model available based upon community need
* Transformed excel based surface distress index calculation system to VC# system
* Developed web-based Google map and associated data viewer using for irrigation project management

## Programming and Computer Skills

* Construction scheduling: Microsoft Project
* Construction estimating: HCSS HeavyBid
* Statistics and data: SPSS, Weka, STATA, JMP, RapidMiner, Data mining add-ins for SQL Server
* Visualization: ArcGIS, Tableau, Gephi, AutoCAD, Adobe Photoshop, GIMP
* Structural design: SAP 2000
* Desktop programming: VB.NET, VC#, Python, QT C#, FORTRAN
* Web programming: HTML, PHP, JavaScript, Google Maps API
* Database: MS Access, MS SQL Server, PostgreSQL, MySQL, SQLite
* Others: Palisade @Risk

## Certifications and Trainings

* Engineer-in-Training (EIT), Board of Professional Engineers and Land Surveyors, Nevada, May 2013.
* Building Drawing by AutoCAD, Institute of Engineering, June 2009.
* Design and Estimate of Gravity Flow Water Supply System, Institute of Engineering March 2008.
* Geographic Information System (GIS), Soft-Tech C.I. Pvt. Ltd, May, 2009.
* Environmental Impact Assessment, January 2009.

# Honors and Awards

* Travel Scholarship, CCEE Graduate Student Council, Iowa State University, 2015
* Best Presentation in Session for the Oral Presentation Competition, 1st Graduate and Professional Students’ Research Conference, Iowa State University, 2014
* GPSS Travel Professional Advancement Grant, Iowa State University, 2014
* Tau Beta Pi – The Engineering Honor Society, 2014
* GPSA Book Scholarship – University of Nevada Las Vegas, 2012
* UNLV Access Grant – University of Nevada, Las Vegas, 2011
* The College Fellowship Scholarship – Pulchowk Campus, 2005-2010
* Freeship – Pulchowk Campus, 2009

# Leadership experience

* Graduate Initiation Officer, Tau Beta Pi – The Engineering Honor Society, 2015
* Graduate and Professional Student Senate, Department of Civil, Construction, and Environmental Engineering, Iowa State University, 2014
* Outreach officer, Nepalese Students’ Association, University of Nevada, Las Vegas, 2012
* Member, Madhyapur Engineering Society, Nepal, 2011
* Vice President, Engineering Students Group of Bhaktapur, Nepal, 2008
* Vice Secretary, Engineering Students Group of Bhaktapur, Nepal, 2007
* Member, Engineering Students Group of Bhaktapur, Nepal, 2006

# Professional Affiliations

* Iowa State University Transportation Students Association, 2015
* UNLV Student Chapters – American Society of Civil Engineers, 2012 - 2013
* Engineers without Borders – UNLV Student Chapter, 2012 – 2013
* Nepal Engineering Council, 2010 – Present
* Civil Engineering Student Society – Nepal, 2005 – 2010

# Volunteering

* Organized Nepalese Cultural Night, University of Nevada, Las Vegas
* Coordinated Civil Engineering Exhibition, Nepal
* Cleaned trash on Lincoln way for adapt-a-highway for Tau Beta Pi, Iowa State University
* Participated in Habitat for Humanity – A Brush with Kindness, University of Nevada, Las Vegas
* Cleaned College Creek for Live Green!, Iowa State University
* Cooked Nepalese dumpling in Festival of Communities, University of Nevada, Las Vegas