

# Natalia Zuniga-Garcia

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Natalia is a doctoral student in Civil Engineering at The University of Texas at Austin. She is interested in the applications of data analytics in transportation engineering and bridging the gap between these areas to provide planning and operations solutions.

## Education

- **The University of Texas at Austin** *Ph.D. in Civil Engineering | Transportation Eng.* (GPA: 3.9175) May 2020 (*Expected*)
- **The University of Texas at Austin** *M.Sc. in Statistics and Data Sciences* (GPA: 3.8571) May 2018
- **The University of Texas at Austin** *M.Sc. in Civil Engineering | Infrastructure Materials* (GPA: 3.7087) May 2017
- **University of Costa Rica** *B.Sc. in Civil Engineering* (GPA: 8.46/10) December 2012

## Experience

- **Graduate Research Assistant** *The University of Texas at Austin (Prof.: Randy B. Machemehl, Jorge A. Prozzi)* 2015 - Present
  - Research areas: traffic analysis and safety, intelligent transportation systems (ITS), and pavement modeling.
- **Teaching Assistant** *The University of Texas at Austin: Cockrell School of Engineering*
  - CE 392M Public Transportation Engineering (Prof.: Randy B. Machemehl) Fall 2018
  - CE 367P Pavement Design and Performance (Prof.: Jorge A. Prozzi) Spring/Fall 2016
- **Interim Professor** *University of Costa Rica: Civil Engineering Department* II Semester 2014
  - IC 0810 Diseño Vial (*Geometric Design*) | Led weekly sessions for fourth-year Civil Engineering students.
- **Research Engineer** *University of Costa Rica: Sustainable Urban Development Program (ProDUS)* 2013 - 2014
  - Research areas: public transport and traffic safety, implementation of land policies for urban development.
- **Undergraduate Research Assistant** *University of Costa Rica: ProDUS and LanammeUCR* 2010 - 2012
  - Use of Geographic Information Systems (GIS) and remote sensing in urban development projects.
  - Successfully implemented new techniques and suggested revisions to Costa Rican specifications on chip seals design.

## Skills

- **Languages** English (*Full professional proficiency*) | Spanish (*Native proficiency*) | Portuguese (*Elementary proficiency*)
- **Programming Languages** *Intermediate proficiency:* R | MATLAB, *Basic proficiency:* Python | SQL
- **Software Packages** ArcGIS | AutoCAD | TSIS-CORSIM | SPSS | SAS | MS Office | L<sup>A</sup>T<sub>E</sub>X

## Main Coursework

Advanced Traffic Flow Theory, Traffic Engineering, Transportation Network Analysis, Public Transportation, Pavement Design and Performance, Concrete Materials, Sensors and Signal Interpretation, Linear Regression and Discrete Choice, Statistical Models for Big Data, Analysis of Variance (ANOVA), Bayesian Statistical Methods, Mathematical Statistics, Statistical Consulting Seminar.

## Publications

6. **Zuniga-Garcia, N.**, M. Tec, S.G. Scott, N. Ruiz-Juri, and R.B. Machemehl. Modeling Ride-Sourcing Trips Demand Using Mixture Models for Dynamic Spatial Poisson-Point Processes. Working Paper.
5. **Zuniga-Garcia, N.**, M. Tec, S.G. Scott, N. Ruiz-Juri, and R.B. Machemehl. Evaluation of Ride-Sourcing Search Frictions and Driver Productivity: A Spatial Denoising Approach. Under review for publication in *Transportation Research Part C*.
4. **Zuniga-Garcia, N.**, and J.A. Prozzi. High-Definition Field Texture Measurements for Predicting Pavement Friction. Under review for publication in *Transportation Research Record*.
3. **Zuniga-Garcia, N.**, H.W. Ross, and R.B. Machemehl. (2018). Multimodal Level of Service Methodologies: Evaluation of the Multimodal Performance of Arterial Corridors. *Transportation Research Record*, 0361198118776112.
2. Kouchaki, S., H. Roshani, J.A. Prozzi, **N. Zuniga-Garcia**, and J.B. Hernandez. (2018). Field Investigation of Relationship between Pavement Surface Texture and Friction. *Transportation Research Record*, 0361198118777384.
1. **Zuniga-Garcia, N.**, W. Martinez-Alonso, A. de Fortier Smit, F. Hong, and J.A. Prozzi. (2018). Economic Analysis of Pavement Preservation Techniques. *Transportation Research Record*, 0361198118768515.

## Presentations

13. **Zuniga-Garcia, N.**, M. Tec, S.G. Scott, N. Ruiz-Juri, and R.B. Machemehl. Evaluation of Ride-Sourcing Search Frictions and Driver Productivity: A Spatial Denoising Approach. Under review for presentation in *98th Annual Meeting of the Transportation Research Board, Washington, DC, January 2019*.
12. **Zuniga-Garcia, N.**, and J.A. Prozzi. High-Definition Field Texture Measurements for Predicting Pavement Friction. Under review for presentation in *98th Annual Meeting of the Transportation Research Board, Washington, DC, January 2019*.
11. **Zuniga-Garcia, N.**, M. Tec, S.G. Scott, N. Ruiz-Juri, and R.B. Machemehl. (2018). Evaluating Spatial Pricing in Ride-Sourcing Systems: A Graph Fused Lasso Denoising Approach. Accepted for presentation in *2018 INFORMS Annual Meeting, Phoenix, AZ, November 2018*.
10. **Zuniga-Garcia, N.**, H.W. Ross, and R.B. Machemehl. (2018). Multimodal Level of Service Methodologies: Evaluation of the Multimodal Performance of Arterial Corridors. 97th Annual Meeting of the Transportation Research Board, Washington, DC, January 2018.
9. **Zuniga-Garcia, N.**, S. Kouchaki, H. Roshani, J.A. Prozzi, and J.B. Hernandez. (2018). Field Investigation of Relationship between Pavement Surface Texture and Friction. 97th Annual Meeting of the Transportation Research Board, Washington, DC, January 2018.
8. **Zuniga-Garcia, N.**, W. Martinez-Alonso, A. de Fortier Smit, F. Hong, and J.A. Prozzi. (2018). Economic Analysis of Pavement Preservation Techniques. 97th Annual Meeting of the Transportation Research Board, Washington, DC, January 2018.
7. **Zuniga-Garcia, N.**, A. de Fortier Smit, and J.A. Prozzi. (2018). Predicting Friction with Improved Texture Characterization. 97th Annual Meeting of the Transportation Research Board, Washington, DC, January 2018.
6. **Zuniga-Garcia, N.**, A. de Fortier Smit, and J.A. Prozzi. (2017). Cuantificación de la macro- y micro-textura del pavimento para la estimación de fricción. XIX Congreso Ibero Latinoamericano del Asfalto (CILA), Medellín, Colombia, November 2017.
5. **Zuniga-Garcia, N.**, W. Martinez-Alonso, and J.A. Prozzi. (2017). Análisis estocástico del costo del ciclo de vida de técnicas de preservación de pavimentos. XIX Congreso Ibero Latinoamericano del Asfalto (CILA), Medellín, Colombia, November 2017.
4. Martinez-Alonso, W., **N. Zuniga-Garcia**, A. de Fortier Smit, and J.A. Prozzi. (2017). Life-Cycle Cost Analysis of Pavement Preservation Techniques in Texas. 96th Annual Meeting the Transportation Research Board, Washington, DC, January 2017.
3. **Zuniga-Garcia, N.**, A. de Fortier Smit, M. Trevino, P. Buddhavarapu, and J.A. Prozzi. (2016). Laboratory Design of Quieter Asphalt Surfaces. 95th Annual Meeting of the Transportation Research Board, Washington, DC, January 2016.
2. **Zuniga-Garcia, N.**, A. de Fortier Smit, M. Trevino, P. Buddhavarapu, and J.A. Prozzi. (2015). Laboratory Design of Quieter Asphalt Surfaces. 27th Annual Road Profile Users' Group (RPUG) Meeting, Raleigh, NC, November 2015.
1. **Zuniga-Garcia, N.**, and F. Elizondo-Arrieta (2013). Propuesta de una metodología para la evaluación del desempeño de tratamientos superficiales en laboratorio. XVII Congreso Ibero Latinoamericano del Asfalto (CILA), Antigua, Guatemala, November 2013.

## Thesis and Technical Reports

6. **Zuniga-Garcia, N.** (2018). Spatial Pricing Empirical Evaluation of Ride-Sourcing Trips Using the Graph-Fused Lasso for Total Variation Denoising (Master's Thesis Report). The University of Texas at Austin, Austin, TX, United States.
5. **Zuniga-Garcia, N.** (2017). Predicting Friction with Improved Texture Characterization (Master's Thesis). The University of Texas at Austin, Austin, TX, United States. Retrieved from <http://hdl.handle.net/2152/47406>.
4. **Zuniga-Garcia, N.** and J.A. Prozzi. (2016). Contribution of Micro- and Macro-Texture for Predicting Friction on Pavement Surfaces. Center for Highway Pavement Preservation (CHPP) Report UTA No. 3-2016.
3. Smit, A. de Fortier, M. Trevino, **N. Zuniga-Garcia**, P. Buddhavarapu, and J.A. Prozzi. (2016). Selection and Design of Quiet Pavement Surfaces. Texas Department of Transportation (TxDOT) Report FHWA/TX-16/0-6819-1.
2. Pujol-Mesalles, R., J. Agueros-Velverde, and **N. Zuniga-Garcia** (2014). Elaboración de auditorías de demanda y cálculo de parámetros operativos del servicio de transporte remunerado de personas, modalidad autobús - Interlineas. Report prepared for Autoridad Reguladora de Servicios Públicos (ARESEP), San José, Costa Rica.
1. **Zuniga-Garcia, N.** (2012). Propuesta de una metodología para la evaluación del desempeño de tratamientos superficiales en laboratorio (Licentiate's Thesis). University of Costa Rica, San José, Costa Rica.

## Relevant Activities

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|---|-------------|
| ○ Student Liaison: <b>Women Transportation Seminar - Heart of Texas (WTS-HOT)</b>                             | 2018 - 2020 |
| ○ President: <b>Women in Transportation Seminar (WTS)</b> UT-Austin Student Chapter                           | 2017 - 2018 |
| ○ Peer Reviewer of Journal Articles: <b>Transportation Research Board (TRB)</b> AFD90 Committee               | 2017        |
| ○ Seminar Series Director: <b>Graduate Engineering Council (GEC)</b> Cockrell School of Engineering UT-Austin | 2017        |
| ○ Committee Member: <b>UT Shuttle Bus Committee</b> Parking and Transportation Services UT-Austin             | 2017 - 2019 |
| ○ Transportation Liaison: <b>Tenant Advisory Board (TAB)</b> Housing and Dining UT-Austin                     | 2017 - 2019 |
| ○ Student Member: <b>Institute of Transportation Engineers (ITE)</b> UT-Austin Student Chapter                | 2017        |
| ○ Student Member: <b>Intelligent Transportation Society (ITS)</b> UT-Austin Student Chapter                   | 2017        |
| ○ Student Member: <b>American Society of Civil Engineers (ASCE)</b> ASCE Student Chapter                      | 2017        |

## Mentoring and Volunteer Experience

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- Mentor: **Directed Reading Program (DRP) Department of Mathematics UT-Austin** (Mentee: Emily Nguyen) 2018
- Mentor: **Graduates Linked with Undergraduates in Engineering (GLUE)** (Mentee: Tiffany Tang) 2017
- Mentor: **University Transportation Center Undergraduate Internship (UTC-UI)** (Mentee: Luis Arruti) 2016
- Mentor: **University Transportation Center Undergraduate Internship (UTC-UI)** (Mentee: Andres Sanchez) 2015
- Volunteer: **Explore UT - Cockrell School of Engineering** UT-Austin Open House Mar. 2017/2018
- Volunteer: **Introduce a Girl to Engineering Day (Girl Day)** Women in Engineering Program (WEP) Feb. 2017/2018
- Volunteer: **Keep Austin Beautiful Adopt a Street Clean-Up** Capital Area Section of ITE (CAS-ITE) Oct. 2017
- Volunteer: **13th Annual Gala** Women Transportation Seminar - Heart of Texas (WTS-HOT) May. 2017

## Honors and Awards

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- **WTS Diane Woodend Jones Leadership Legacy Scholarship** Women's Transportation Seminar (WTS) International 2018
- **WTS Leadership Legacy Scholarship** Women's Transportation Seminar - Heart of Texas (WTS-HOT) 2018
- **Leadership Collaborative Leader Award** Women in Engineering Program (WEP) at The University of Texas at Austin 2018
- **Professional Development Award** Graduate School at The University of Texas at Austin 2016
- **Innovation and Human Capital Program for Competitiveness Scholarship** 2015  
Inter-American Development Bank (IDB) and Ministry of Science and Technology (Costa Rica)