

# Ricardo O. Jacome

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## EDUCATION

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### *University of Nebraska – Lincoln*

2017-2021

- Doctor of Philosophy Ph.D. in Mechanical Engineering and Applied Mechanics (3.94 GPA)
  - Area of Study: Vehicle Dynamics
- Dissertation: “On Road Coordinates for Autonomous Vehicle Guidance”, *Advisor Dr. Cody Stolle*.

### *University of Texas – Rio Grande Valley*

2013-2017

- Bachelor of Science in Mechanical Engineering (3.98 GPA)
  - Minor in Business Administration (4.00 GPA)

## WORK/RESEARCH EXPERIENCE

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### *Senior Systems Engineer*

*Bridgestone Americas Technology Center*

2021-2025

- R&D at Advanced Digital Solutions under Bridgestone Americas, in charge of cross-functional projects involved in the deployment of algorithms for Predictive Maintenance and Tire Mounted Sensor Technology in Intelligent Tires.
  - Tire-Wear Model: Developed physics-based and ML-based Digital Twin models for tire and vehicle systems. The process involved coordinating, and post-processing multi-domain data coming from: material testing, indoor testing, outdoor testing, HPC FEA simulations (Abaqus), data science, and product development.
  - Standardized, automated, debugged, optimized and created instructions for current methodologies (e.g. Python scripting in Linux environments) while maintaining continuous improvement for multiple projects, increasing the speed efficiency for models in production environment.
  - Tire-Load Model: In charge of project for developing conception, testing, verification, validation, implementation, and scaling of algorithms in telematics systems.
  - Extensive experience with Python for data analysis, data visualization, and algorithm development.
- Deploying large-scale data algorithms in HPC cloud infrastructure for IoT transportation systems. Monitored and performed statistical analysis, visualization, and algorithm development on large datasets.
- Testing experience includes planning, execution, and post-processing of the following:
  - Drum/Flat-trac testing of commercial/passenger tires with embedded sensors.
  - Vehicle/Fleet testing, both commercial and passenger vehicles with tire embedded sensors and DAQ systems.
  - Friction testing at Proving Grounds in snow, ice, dry and wet surfaces.

### *Graduate Research Assistant*

*University of Nebraska – Lincoln*

2017-2021

- Lead researcher in autonomous vehicle research in trajectory generation, geometric road representation, and vehicle dynamics.
  - Collaborated closely with students and professors from multi-disciplinary engineering areas including Control Systems, Software Engineering, and V2X Communications.
  - Simulation and testing for vehicle stability performance and analysis of vehicle trajectory generation.
  - In charge of developing test plans for vehicle-dynamic performance and stability evaluations in accordance with AASHTO's Geometric Design of Highway and Streets.

- Coordinated, planned, executed, and post processed analysis for split-mu testing.
- Data analyst for Midwest Roadside Safety Facility working in FEA simulations (LS-Dyna) in Linux systems with HPCs for full-scale car crash testing analysis of vehicle and barrier systems.
  - Coordinated with construction crews and design teams for development and testing of barrier systems.
  - Experience in the execution of testing for car crash worthiness and evaluations for DOT clients.
  - Evaluation of barrier car crash worthiness based on NHTSA standards for rider safety.
- Experience with instrumentation on high-speed DAQs, high-precision localization, filtering techniques, and sensor data analysis (accelerometers, rate transducers) for both car-crash worthiness evaluations and vehicle-dynamic performance.
- Familiarity with standards and procedures for car crashes, and friction bed tests in accordance with SAE J2505, J211-1, J299, and J874.
- Lead in charge of managing and organizing student teams (~20) for car-crash documentation and analysis. Acted as student liaison to the administration and increased the department's efficiency.
- Virtual and physical material characterization and strength measurements.

**Teaching Assistant** *University of Nebraska – Lincoln* 2020-2021

- Grader for dynamics class of ~80. Provided students with guidance, tutoring, and mentorship for success in their classes. Developed teaching lesson plans and taught lessons for Partial Differential Equations.

**Teaching Assistant** *University of Texas – Rio Grande Valley* 2015-2017

- Mentor for an engineering class of ~120 undergraduate students. Explained concepts to students and graded lab reports. Class topics included: Linear Algebra, Probability, Statistics and Vector Calculus.

**Science Tutor** *University of Texas – Rio Grande Valley* 2014-2017

- CRLA Level 2 Certified. Tutored students in the areas of Chemistry, Physics, Math and Engineering. Certified to train entering level tutors into the customer service environment.

**UTCRS Internship** *Mid-America Transportation Center* Summer 2015

- Position focused development of dynamic simulations on Adams MSC software for slopes at railway intersections. Created cost-benefit analysis into the deletion of these slopes for the railway industries.

## PROFESSIONAL ACTIVITIES

- Treasurer for B-Unidos (ERG); creating yearly budgets and coordinating cultural outreach. 2021-2025
- Peer Reviewer for the Tire Science and Technology Journal. 2021-2025

## SOFTWARE PROFICIENCY

- **MS Office Suite:** Word, PowerPoint & Excel
- **Design/Simulation Software:** SolidWorks, AutoCAD, Adams MSC, CarSim, & TruckSim
- **Finite Element Analysis Software:** Autodesk Simulation, Abaqus & LS-Dyna
- **Cloud HPC:** Databricks on Microsoft Azure
- **Programming/Processing Software:** MATLAB, Simulink, Python, SQL & Apache PySpark
- **Python Libraries:** Numpy/Pandas, Matplotlib/Seaborn, Sci-Kit Learn, Keras/PyTorch & Filterpy (Kalman)

## DATA ACQUISITION SYSTEMS

- **Standalone:** Dewesoft, VBox, SLICE, VC4000 & Oxts
- **Telematics:** VBox Sport, Webfleet, & Geotab

## PROJECT PORTFOLIO

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|---|---|--|---|
| ○ <a href="#">FFT on Steering Wheel Vibration</a> | ○ <a href="#">FEA on Tire De-beading Simulation</a> | ○ <a href="#">Inverted PID Pendulum Controller</a> | ○ <a href="#">Wavelet Analysis on Accelerations</a> |
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## RELEVANT COURSEWORK

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- **Tire Mechanics Short Course** - By the University of Akron
- **Wear Mechanics, Vehicle Dynamics, Compounding, Tire Pattern Design** – By Bridgestone
- **Foundations of Digital Transformation** – By Stanford University
- **Introduction to Abaqus/CAE** – By Dassault Systems
- **Reconstruction and Analysis of Rollover Crashes of Light Vehicles** – By SAE
- **SciPy Conference Workshops**
- **Continuum Mechanics** – By University of Nebraska - Lincoln
- **Non-Linear Optimization** – By University of Nebraska – Lincoln
- **Plasticity of Materials** – By University of Nebraska – Lincoln
- **Data-driven Models** – By University of Nebraska – Lincoln

## SKILLS

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- Fluent in English and Spanish
- Intermediate French
- Beginner Italian and Japanese

## PUBLICATIONS

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### Peer-Reviewed Journal Articles

- **Jacome, R.**, Stolle, C. and Sweigard, M., “*Road Curvature Decomposition for Autonomous Guidance*,” SAE Technical Paper 2020-01-1024, 2020, doi:10.4271/2020-01-1024.
- **Jacome, R. O.**, Stolle, C., Faller, R. K., Grispos, G., “*A Dynamically-Concise Roadmap Framework for Guiding Connected and Automated Vehicles*” 2021 IFIP/IEEE International Symposium on Integrated Network Management (IM), 2021, pp. 1009-1017.

### Internal Reports

- **Jacome R.** Stolle, C., & Sweigard M., “*Smart Barrier Scheme for Autonomous Guidance - MATC Year Two Report*”, Internal Report, October 2019.
- **Jacome R.** Stolle, C., & Sweigard M., “*Virtual Barriers for Mitigating and Preventing Run-off Crashes, Phase I*”, Mid-America Transportation Center, Internal Report, August 2018.

## PRESENTATIONS

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- **Jacome, R. O.**, “*A Dynamically-Concise Roadmap Framework for Guiding Connected and Automated Vehicles*” IFIP/IEEE IM 2021 - 4th International Workshop on Intelligent Transportation and Autonomous Vehicles Technologies. Bordeaux, France, May 2021
- **Jacome R. O.**, “*Road Coordinates for Autonomous Vehicle Guidance*” Safety Performance and Analysis Doctoral Student Competition. P21-2128, at Transportation Research Board, Washington, DC, January 2021
- **Jacome R. O.**, “*Midwest Virtual Road Corridor (MVRC): An ultra-compact road map representation for CAVs*” Dwight David Eisenhower Transportation Fellowship Program Posters. P21-20421, January 2021
- **Jacome R.**, “*Road Curvature Decomposition for Autonomous Guidance*”, Poster Presentation, Dwight Eisenhower Panel at Transportation Research Board, Washington, DC, January 2020
- **Jacome R.**, Trevino T. “*Multibody Simulation for Intersecting Slopes at Railway Roads using ADAMS MSC Software*”, Presentation, The University of Texas Rio Grande Valley, UTCRS Symposium, Edinburg, TX, October 2015.
- **Jacome R.**, Garcia R., Stutz J., & Moya J. “*Second Generation Multi-Station Polymer Creep-Tester*”, Presentation, The University of Texas Rio Grande Valley, Senior Design Project, Edinburg, TX, May 2017.

## AWARDS

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- [Dwight D. Eisenhower Transportation Research Fellowships \(2019, 2020, 2021\)](#)
- [SAE Doctoral Research Fellow \(2020\)](#)
- [SAE Heinz C. Pretcher Scholarship \(2018\)](#)
- Mid-America Transportation Center's Region VII University Transportation Centers Student of the Year (2018)
- The Nebraska Engineering Recruitment Fellowship (2017)