Ricardo O. Jacome

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EDUCATION

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

Senior Systems Engineer *Bridgestone Americas Technology Center* 2021-*Present*

- Senior Researcher and Development for the Digital Lab under Bridgestone Americas in charge of cross-functional projects involved in the deployment of algorithms for Predictive Maintenance and Tire Mounted Sensor Technology for Intelligent Tires.
  - Tire-Wear Estimation Model: In charge of creating tire and vehicle digital twin models for tire wear projections. Process involved multidisciplinary aspects including working with compounders for testing, indoor testing, Abaqus FEA simulations, working with tread design teams. Data is analyzed in multi-platform workstreams (including Python, PySpark on Databricks, CarSim, and Trucksim) to create tire wear predictions.
  - Improved current methodologies and expanded on generality of the vehicle and tire models.
  - Tire-Load Estimation Model: In charge of project for developing from conception, testing, validation, implementation, and scaling of algorithm in telematics systems.
  - Extensive experience with Python for data analysis and development (Numpy, Pandas, Sympy, SciPy)
- In charge of planning experiments, coordinating engineers, developing techniques to automate current work-flows, connecting multi-platform environments, testing, execution, data post processing, and improving novel algorithms related to predictive maintenance and intelligent tire technology.
- Testing experience includes planning, execution, and post processing of the following:
  - Drum testing of commercial tires and intelligent tires with embedded sensors.
  - Vehicle testing, both commercial and passenger vehicles with tire embedded sensors and DAQ systems.
  - Field testing including snow, ice, dry and wet friction testing.
- Deploying large-scale data algorithms in Databricks; monitoring and performing statistical analysis on large datasets.
- Constructed vehicle models in CarSim for simulations with enhanced tire models.

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.
  - 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 LS-DYNA simulations for full-scale car crash testing analysis.
  - 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.

- o Evaluation of barrier car crash worthiness based on NHTSA standards for rider safety.
- Experience with instrumentation on high-speed data acquisition systems, high-precision localization, filtering techniques, and sensor data analysis (accelerometers, rate transducers) for both car-crash worthiness evaluations and vehicle-dynamic performance.
- Familiarity with current standards and procedures for car crashes, and friction bed tests in accordance with SAE J2505, J211-1, J299, and J874.
- Graduate student leader in charge of managing and organizing student teams (~20) for car-crash documentation and analysis. Acted as student liaison to the department administration to implement methodology that had the potential to increase the department's efficiency.
- Prepared technical reports on testing and data analysis.
- Material testing experience for characterization and strength measurements.

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

- Grader for undergraduate dynamics class of ~80. Explained concepts and graded homework assignments.
- 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 in an engineering class of ~120 undergraduate students. Explained concepts to students and graded lab reports. Class topics covered were 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.

SOFTWARE

- *Microsoft Software*: Word, PowerPoint, Excel
- *Design/Simulation Software*: Adams MSC, CarSim, Trucksim, Simulink
- *Finite Element Analysis Software*: Autodesk Simulation, Abaqus & LS-Dyna
  - o FEA on Tire De-beading Simulation: https://tinyurl.com/FEATire
- *Programming/Processing Software:* MATLAB, Python, Apache PySpark,
  - o FFT Analysis on Steering Wheel Vibration: https://tinyurl.com/FFTVibration
  - o Inverted PID Pendulum Controller: https://tinyurl.com/ControllerPendulum
  - o Wavelet Analysis on Accelerations: https://tinyurl.com/WaveletAnalysis
- *Data Collection:* Dewesoft, VBox, OxTS, Geotab, Azuga

RELEVANT COURSEWORK

- **Tire Mechanics Short Course** - By the University of Akron
- **Wear Mechanics, Ride and Handling, Tire-Force Moments, NVH, Compounding, Advanced Material Technology, Tire Pattern Design** – By Americas Technology Center
- **Foundations of Digital Transformation** – By Stanford University
- **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

Fluent in English and Spanish	Intermediate French	Beginner Italian and Japanese

PUBLICATIONS

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

- **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.