

# Ricardo O. Jacome

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## EDUCATION

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### **University of Nebraska – Lincoln**

Estimated Graduation Date: May 2021

- Doctor of Philosophy Ph.D. in Mechanical Engineering and Applied Mechanics (3.94 GPA)
  - Specialization in Dynamics & Vibrations
  - Secondary Area of Study: Systems, Design and Controls
- Dissertation: “On-Road Coordinate Decomposition for Autonomous Vehicle Guidance”, *Advisor Dr. Cody Stolle*.

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

May 2017

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

## FUNDED RESEARCH, FELLOWSHIPS, SCHOLARSHIPS

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### **Grants**

“Virtual Barriers for Mitigating and Preventing Run-off-Road Crashes – Year 4” Funded by Mid-American Transportation Center, \$150,000 (2020-2021)

“Virtual Barriers for Mitigating and Preventing Run-off-Road Crashes – Year 3” Funded by Mid-American Transportation Center, \$120,000 (2019-2020)

### **Fellowships**

Dwight David Eisenhower Transportation Fellowship, \$20,000 (2018-2021)

Nebraska Engineering Recruitment Fellowship \$10,000 (2017-2019)

### **Scholarships**

Society of Automotive Engineers (SAE) Doctoral Engineering Scholarship 2020-2021

SAE/Heinz C. Prechter Automotive Excellence Scholarship for Young Innovators 2017-2018

Mid America Transportation Center Student of the Year Award 2018

## WORK/RESEARCH EXPERIENCE

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### **Graduate Research Assistant**

University of Nebraska – Lincoln

2017-Present

- 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.
- In charge of developing test plans for vehicle-dynamic performance and stability evaluations.
- Data analyst for Midwest Roadside Safety Facility involved in Finite Element Analysis simulations for crash testing analysis.
  - Coordinated with construction crews and design teams for development and testing of barrier systems
- 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 J211-1, J299, and J874.
- Graduate student leader in charge of managing and organizing student teams (~20) for crash documentation and analysis.
- Prepared technical reports on testing and data analysis.
  - Prepared and presented technical presentations on multiple research topics.
- Material testing experience for characterization and strength measurements.
- Acted as student liaison to the department administration to implement methodology that had the potential to increase the department’s efficiency.

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

- Grader for undergraduate dynamics engineering class of ~80. Explained concepts to students and graded homework assignments.
- Provided students with guidance, tutoring, and mentorship for success in their classes.
- Developed teaching lesson plans.

**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.

## ASSOCIATIONS

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| • Tau Beta Pi, Member (2016-Present)               | • Society of Automotive Engineers (2018-Present)                  |
| • Hispanic Scholarship Fund Scholar (2018-Present) | • Society for Industrial and Applied Mathematics (2019 – Present) |
|  | • The Vibrations Institute (2019-Present)                         |

## SOFTWARE PROFICIENCY

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- **Microsoft Software:** Word, PowerPoint, Excel
- **Design/Simulation Software:** Adams MSC, CarSim, Simulink
- **Finite Element Analysis Software:** Autodesk Simulation & LS-Dyna
  - FEA on Tire Debeading Simulation: <https://tinyurl.com/FEATire>
- **Programming/Processing Software:** MATLAB, LabView, Arduino, Python, HTML, CSS
  - FFT Analysis on Steering Wheel Vibration: <https://tinyurl.com/FFTVibration>
  - Inverted PID Pendulum Controller: <https://tinyurl.com/ControllerPendulum>
  - Wavelet Analysis on Accelerations: <https://tinyurl.com/WaveletAnalysis>
- **Optimization/Mathematical Modeling:** AMPL, Gurobi, MINOS

## SKILLS

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| • Fluent in English and Spanish | • Machine Learning/Neural Network Design |
| • Intermediate French           | • Optimization Programming               |

## 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*” IFIP/IEEE IM 2021 - 4th International Workshop on Intelligent Transportation and Autonomous Vehicles Technologies. Bordeaux, France, May 2021, Manuscript Accepted for Publication
- **Jacome, R. O.**, Stolle, C., K., Grispos, G., “*Optimization of Road Reference Profiles for Connected and Automated Vehicles*”. *IEEE, Transactions in Intelligent Transportation Systems*, Manuscript Submitted

### 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.**, “*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.