

# Adrian Rodriguez

*Ph.D.*

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## EDUCATION

2011 – 2014 **Ph.D. in Mechanical Engineering**, *Department of Mechanical and Aerospace Engineering*, University of Texas at Arlington.

### PH.D. DISSERTATION

Title *Dynamic Simulation of Multibody Systems in Simultaneous, Indeterminate Contact and Impact with Friction*

Committee Dr. Alan Bowling (Advisor), Dr. Panos Shiakolas, Dr. Kent Lawrence, Dr. Ashfaq Adnan, Dr. Bo Wang

2009 – 2010 **M.S. in Mechanical Engineering**, *Department of Mechanical and Aerospace Engineering*, University of Texas at Arlington.

### MASTER'S THESIS

Title *Simulation of Indeterminate Multi-Point Impact and Contact with Friction*

Committee Dr. Alan Bowling (Advisor), Dr. Kamesh Subbarao, Dr. Daejong Kim

2005 – 2009 **B.S. in Mechanical Engineering**, *Department of Mechanical Engineering*, University of Texas at Austin.

### UNDERGRADUATE RESEARCH

Topic *Environmental Effects of Paint Body on the Hull of a Ship*  
Advisor Dr. Alfred Traver

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## TEACHING/WORK EXPERIENCE

- July 2013 – Present Mechanical Engineer, Clovis Research, L.C.
- Jan – May 2014 Graduate Research Assistant/Intern, Robotics Division, University of Texas at Arlington Research Institute
- Jan – May 2014 Adjunct Professor, Thermodynamics II, Department of Mechanical and Aerospace Engineering, University of Texas at Arlington
- Sept – Dec 2010 Graduate Teaching Assistant, Introduction to Robotics, Department of Mechanical and Aerospace Engineering, University of Texas at Arlington
- June – Aug 2010 Graduate Research Assistant, Supervisor: Dr. Alan Bowling, Department of Mechanical and Aerospace Engineering, University of Texas at Arlington
- Jan – May 2010 Graduate Teaching Assistant, Measurements Laboratory II, Department of Mechanical and Aerospace Engineering, University of Texas at Arlington

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## PUBLICATIONS

- 2015 Rodriguez, A. and Bowling, A. *Study of Newton's cradle using a new discrete approach*, Multibody System Dynamics. **33** (1) January, pp. 61-92.
- 2014 Rodriguez, A. *Dynamic simulation of multibody systems in simultaneous, indeterminate contact and impact with friction*, University of Texas at Arlington, April. Ph.D. Dissertation.
- Rodriguez, A. and Bowling, A. *Analytic solution for planar indeterminate impact problems using Stronge's hypothesis*, Multibody System Dynamics. (under review)
- Rodriguez, A. and Bowling, A. *Analytic solution for planar indeterminate multiple point impact problems with Coulomb friction*, ASME 2014 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC/CIE), Buffalo, New York, August. Conference proceedings.
- Rodriguez, A. and Bowling, A. *Study of the stick-slip transition of Newton's cradle with friction*, ASME 2013 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC/CIE), Portland, Oregon, August. Conference proceedings.
- Rodriguez, A. and Bowling, A. *Analytic treatment of Newton's Cradle using constraints*, ECCOMAS Thematic Conference on Multibody Dynamics, Zagreb, Croatia, July. Conference proceedings.
- 2012 Rodriguez, A. and Bowling, A. *Analytic solution to 3-dimensional, single point collision problems using Stronge's hypothesis*, 2<sup>nd</sup> Joint International Conference on Multibody System Dynamics (IMSD), Stuttgart, Germany, May. Conference proceedings.
- Rodriguez, A. and Bowling, A. *Solution to indeterminate multipoint impact with frictional contact using constraints*, Multibody System Dynamics. **28** (4) November, pp. 313-330.
- 2011 Rodriguez A. and Bowling, A. *Indeterminate multipoint impact with friction of agile legged robots*, IEEE International Conference on Robotics and Biomimetics (IEEE-ROBIO), Phuket Island, Thailand, December. Conference proceedings.
- Rodriguez A. and Bowling, A. *Simulation of indeterminate multipoint impact and contact with friction*, ECCOMAS Thematic Conference on Multibody Dynamics, Brussels, Belgium, July. Conference proceedings.
- 2010 Rodriguez, A. *Simulation of indeterminate multipoint impact and contact with friction*, University of Texas at Arlington, November. Master's Thesis.

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## CONFERENCE AND SEMINAR PRESENTATIONS

- 2013 *Study of the stick-slip transition of Newton's cradle with friction*, ASME IDETC/CIE, Portland, Oregon, August 4-7.
- Study of the stick-slip transition of Newton's cradle with friction*, MAE Brown Bag Seminar Series, Arlington, Texas, February 20.
- 2012 *Analytic solution to 3-dimensional, single point impact problems*, IMSD, Stuttgart, Germany, May 29-June 1.
- Advances in three-dimensional impact problems*, MAE Brown Bag Seminar Series, Arlington, Texas, May 2.

*Analysis of planar multipoint impact problems*, Annual Celebration of Excellence by Students (ACES) symposium, University of Texas at Arlington, March 22-24.

2011 *Indeterminate multipoint impact with friction of agile legged robots*, IEEE-ROBIO, Phuket Island, Thailand, December 7-11.

*Analytic solution of indeterminate multipoint impact with friction using Stronge's hypothesis*, MAE Brown Bag Seminar Series, Arlington, Texas, October 19.

*NASA RASC-AL Exploration Robo-Ops Competition 2011*, Mechanical and Aerospace Engineering - Industry Advisory Board Meeting, Arlington, Texas, October 18.

*Indeterminate multipoint impact and contact with friction*, ECCOMAS on Multibody Dynamics, Universite catholique de Louvain, Brussels, Belgium, July 4-7.

*Simulation of indeterminate multipoint impact and contact with friction*, ACES symposium, University of Texas at Arlington, March 23-25.

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## ENGINEERING PROJECTS

2012 - 2013 October 1 - June 20

**Defense Advanced Research Projects Agency (DARPA) Robotics Challenge.**

Objective My role in this project involved the implementation of contact modeling and control methods for the walking task. The consideration of walking on uneven terrain (i.e. steps, slopes, etc.) with varying surface conditions (i.e. restitution, friction, etc.) presented the most challenging aspect of the competition.

2011 & 2012 May 22-25, May 29-June 1

**National Aeronautics and Space Administration (NASA) Revolutionary Aerospace Systems Concepts-Academic Linkage (RASC-AL) Exploration Robo-Ops (ERO) Competition.**

Objective My involvement in this project included several different roles such as the design of the manipulator arm, chassis, and suspension system. In addition, I performed a dynamic analysis of the arm and rover designs, and served as the team lead for the project.

2010 **Quadruped Leg and Chassis Redesign.**

Objective The housing of motors and gear boxes, was redesigned by employing 90-degree pulleys while maintaining the original cable-driven system controlling the coxa, femur, and tibia. In addition, a chassis was designed to hold motor controllers, batteries, electronics, cooling fan and mounting connections of all four legs.

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## PROFESSIONAL ACTIVITIES

Reviewer International Conference on Informatics in Control, Automation and Robotics (ICINCO)

Institute of Electrical and Electronics Engineers (IEEE) International Conference on Robotics and Automation (ICRA)

Institute of Electrical and Electronics Engineers (IEEE)/Robotics and Biomimetics (ROBIO)

Multibody System Dynamics Journal

Institute of Electrical and Electronics Engineers (IEEE)/Robots and Systems Journal (RSJ) International Conference on Intelligent Robots and Systems (IROS)

Computer Science Undergraduate Research Journal (CS-URJ)

Judge Poster Session, University of Texas System Louis Stokes Alliance for Minority Participation Student Research Conference and Alliance Meeting, September 2011

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## HONORS, AWARDS, & FELLOWSHIPS

- 2013 Travel Award of the Graduate Student Senate, August
- 2011 Travel Award of the Graduate Student Senate, July and December  
Louis Stokes Alliance for Minority Participation-Bridge to the Doctorate (LSAMP-BD) Fellowship, University of Texas at Arlington  
Golden Key Officer Scholarship  
Outstanding Service Award, UTA Volunteers
- 2010 Academic Excellence Award, University of Texas at Arlington

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## SYNERGISTIC ACTIVITIES

- Member Graduate Student Senate, February 2011–May 2014  
R.O.V.E.R. Society at UTA, Jan. 2011–May 2014  
Golden Key International Honour Society, March 2010–Present  
UTA Volunteers, September 2009–December 2013  
American Society of Mechanical Engineers, Sept. 2007–Present  
Robotics and Automation Society, September 2008–May 2009
- Positions Held Secretary/VP–Graduate Student Senate, Feb. 2012–May 2013/Aug. 2013–May 2014  
Community Service Chair–Latin American Student Org., Aug. 2012–May 2013  
Chair–Registration, Calendar and Scheduling Committee, October 2011–May 2013  
Social Director–Golden Key International Honour Society, September 2010–May 2011  
Membership Director–UTA Volunteers, September 2010–May 2011
- Volunteer Computer Teacher–Arbrook Retirement Living Community, Sept. 2011–Present
- Mentor I Engage Mentoring Program, Summer 2012  
UTA Helping Other Students to Succeed, September 2011–Dec. 2014

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## COMMUNITY SERVICE

- 2014 28 Hours
- 2013 32 Hours
- 2012 66.5 Hours
- 2011 53 Hours
- 2010 12 Hours

\*\*For a detailed list of service projects, please inquire.

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## UPDATED

January 7, 2015