

**Luis Rodolfo GARCIA CARRILLO**

Electrical Engineering & Mechanical Engineering  
 Texas A&M University - Corpus Christi  
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**RESEARCH INTERESTS**

My expertise draws from the areas of control systems, multi-agent systems, unmanned aircraft systems (UAS), and game theory. The study of these fields together with the essential underlying physics and sensors of unmanned agents allows the development of low-level autopilot strategies for stability, as well as of higher-level functions for path planning and motion coordination. Experimental validation of my theoretical developments include autonomous navigation and coordination of UAS in environments where human interactions are limited or not possible.

**EDUCATION**

- **Post-Doctoral Fellow**, Control Systems June 2013  
 - Institution: University of California, Santa Barbara, USA  
 - Laboratory: Center for Control, Dynamical-Systems, and Computation  
 - Adviser: Joao Hespanha
- **Ph.D.**, Control Systems Sept, 2011  
 - Institution: University of Technology of Compiègne - Sorbonne University, France  
 - Dissertation Title: Vision-based hovering and trajectory tracking of a quad-rotor  
 - Adviser: Rogelio Lozano
- **M.Sc.**, Electrical Engineering Sept, 2007  
 - Institution: Institute of Technology of La Laguna. Coahuila, México  
 - Dissertation: Computer vision techniques for automatic takeoff and landing of helicopters  
 - Adviser: Alejandro Dzul
- **B.Sc.**, Electronic Engineering May, 2003  
 - Institution: Institute of Technology of La Laguna. Coahuila, México

**ACADEMIC APPOINTMENT**

- **Assistant Professor** August, 2013 - Present  
 Electrical Engineering (EE) and Mechanical Engineering (ME)  
 School of Engineering and Computing Sciences (ENCS)  
 Texas A&M University - Corpus Christi  
 Corpus Christi, TX, 78412-5797
- **Assistant Professor** August, 2015 - December 2016  
 Electrical Engineering  
 College of Engineering  
 University of Nevada, Reno  
 Reno, NV 89557-0260

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**SELECTED UNIVERSITY POSITIONS**

- **Director** July, 2013 - Present  
 Unmanned Systems Laboratory (TAMUCC-USL)  
 Texas A&M University - Corpus Christi  
 Corpus Christi, TX, USA
- **Director** August, 2015 - December, 2016  
 Unmanned Systems Laboratory (UNR-USL)  
 University of Nevada, Reno  
 Reno, NV, USA
- **Postdoctoral Researcher** Feb, 2012 - June, 2013  
 Institute of Collaborative Biotechnologies (ICB)  
 University of California, Santa Barbara, USA  
 Project: Bio-inspired global video tracking by networks of unmanned aircraft systems  
 Grant: W911NF-09-D-0001 from the U.S. Army Research Office (ARO).
- **Visiting Researcher** Oct, 2011 - Jan, 2012  
 French-Mexican Laboratory on Computer Science and Control  
 CINVESTAV - IPN, México D.F., México
- **Graduate Student Researcher** Sept, 2008 - Sept, 2011  
 Heuristics and Diagnostics for Complex Systems (Heudiasyc)  
 University of Technology of Compiègne. Compiègne, France  
 Project: Autonomous Take-off and Landing of Unmanned Aircraft Systems  
 Adviser: Rogelio Lozano  
 Supported by: CONACYT, CNRS, and Picardie French Region Project ALTO

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**TEACHING EXPERIENCE**

- Currently Teaching:
  - GSCS6102 - Graduate Seminar
  - EEEN4420/MEEN4420 - Engineering Measurements
- In the Near Future:
  - COSC6590/GSCS6390 - Game Theory (Fall 2019)
- Taught in the Past:
  - COSC6590/GSCS6390 - Game Theory (Fall 2018)
  - EEEN4420/MEEN4420 - Engineering Measurements (Fall 2017, Spring 2018, Fall 2018)
  - ENGR4390 - Control Systems II (Fall 2017, Fall 2014)
  - EEEN3330/ENTC4446 - Control Systems I (Spring 2017, Spring 2016@UNR, Spring 2015@UNR, Spring 2014)
  - Directed Independent Study (DIS) (2018, 2016@UNR, 2015@UNR, 2014)

- EE426/EE626 - Advanced Microprocessor Engineering. (Fall 2016@UNR, Fall 2015@UNR)
- COSC1330 - Programming for Scientists, Engineers, and Mathematicians. (Fall 2014, Spring 2015)
- ENGR2326 - Dynamics (Fall 2013)
- **Santa Barbara High School. Santa Barbara, California**                      Sept 2012 - June 2013
  - Physics & Green Engineering - Robotics
  - Role: Robotics and Control Systems Mentor
- **University of Technology of Compiègne. Compiègne, France**                      Sept 2008 - Sept 2011
  - SIT58 - Control and observation of embedded real-time systems
  - Role: Teaching Assistant

## AWARDS AND DISTINCTIONS

- National System of Mexican Researchers SNI - Level I (granted by CONACYT - Mexico. Dates: 2014 - present)  
This award recognizes the work of a Mexican Researcher dedicated to the production of scientific knowledge and technology. The Mexican National Council of Science and Technology (CONACYT) it is the equivalent of USA's National Science Foundation (NSF).

## PUBLICATIONS

### Books

- [1] L.R. García Carrillo, A. Dzul, R. Lozano and C. Pégard. Quad Rotorcraft Control: Vision-Based Hovering and Navigation. *Springer*, ISBN-10: 1447143981, September 2012.

### Journal Publications (ISI-Thomson JCR)

Submitted / Under review / In preparation

- [1] L.R. García Carrillo, K.G. Vamvoudakis. “Deep-Learning Tracking for Autonomous Flying Systems Under Adversarial Inputs”. *Submitted*, 2018.

Accepted / Published

- [2] J. Xie, L.R. Garcia Carrillo, and L. Jin, “An Integrated Traveling Salesman and Coverage Path Planning Problem for Unmanned Aircraft Systems”, *IEEE Control Systems Letters*, vol. 3, issue 1, pp. 67-72, January, 2019.
- [3] M. Jafari, H. Xu, and, and L.R. Garcia Carrillo, “A neurobiologically-inspired intelligent trajectory tracking control for unmanned aircraft systems with uncertain system dynamics and disturbance”, *Transactions of the Institute of Measurement and Control*, April, 2018. DOI10.1177/0142331218763007.
- [4] F. Munoz, E.S. Espinoza Quesada, G. Sanahuja, S. Salazar, O. Garcia, and L.R. Garcia Carrillo, “Testbed for Applications of Heterogeneous Unmanned Vehicles”, *International Journal of Advanced Robotic Systems*, vol., 14 issue 1, January 20, 2017.

- [5] F. Munoz, E.S. Espinoza Quesada, H.M. La, S. Salazar, S. Commuri, and L.R. Garcia Carrillo, "Adaptive consensus algorithms for real-time operation of multi-agent systems affected by switching network events", *International Journal of Robust and Nonlinear Control (Special Issue on Consensus-Based Applications in Networked Systems)*, DOI: 10.1002/rnc.3687, October 2016.
- [6] E.S. Espinoza, L.R. García Carrillo, A. Ramirez, and S. Mondié. "Algebraic Dominant Pole Placement Methodology for Unmanned Aircraft Systems with Time-Delay". *IEEE Transactions on Aerospace and Electronic Systems*, vol. 52, issue 3, pp. 1108-1119, June 2016.
- [7] L.R. García Carrillo, K.G. Vamvoudakis, and J.P. Hespanha. "Optimal Adaptive Control for Weakly Coupled Nonlinear Systems: A Neuro-Inspired Approach". *International Journal of Adaptive Control and Signal Processing (Special Issue on From Adaptive Control to Variable Structure Systems: Seeking for Harmony)*, vol. 30, issue 8-10, pp. 1494-1522, August-October, 2016.
- [8] E. Monroy Cruz, A. Garcia Barrientos, E.S. Espinoza Quesada, L.R. García Carrillo, and R. Tapia Olvera. "An Unmanned Ground Vehicles Experimental Setup for Image-Based Object Tracking". *IEEE Latin America Transactions*, vol. 13, issue 9, September 2015.
- [9] V. Santibáñez, A. Zavala Río, L.R. García Carrillo, and J. Moreno Valenzuela. "New Achievements in Control of Robotic Systems". *Mathematical Problems in Engineering*, vol. 2015, Article ID 514105, March 2015. doi:10.1155/2015/514105.
- [10] L.R. García Carrillo, I. Fantoni, E. Rondon, and A. Dzul. "3-dimensional Position and Velocity Regulation of a Quad-rotor Using Optical Flow". *IEEE Transactions on Aerospace and Electronic Systems*, vol. 52, issue 1, pp. 358-371, January 2015.
- [11] L.R. García Carrillo, W.J. Russell, J.P. Hespanha, and G.E. Collins. "State Estimation of Multi-Agent Systems under Impulsive Noise and Disturbances". *IEEE Transactions on Control Systems Technology*, vol. 23, issue 1, pp. 13-26, January 2015.
- [12] L.R. García Carrillo, G. Flores, G. Sanahuja, and R. Lozano. "Quad Rotorcraft Switching Control: An Application for the Task of Path Following". *IEEE Transactions on Control Systems Technology*, vol. 22, issue 4, pp. 1255-1267, July 2014.
- [13] A. Ramírez, E.S. Espinoza, L.R. García Carrillo, S. Mondié, A. García, and R. Lozano, "Stability Analysis of a Vision-Based UAV Controller: An Application to Autonomous Road Following Missions". *Journal of Intelligent and Robotic Systems*, vol. 74, issue 1-2, pp. 69-84, April 2014.
- [14] J.E. Gomez Balderas, G. Flores, L.R. García Carrillo and R. Lozano. "Tracking a Ground Moving Target with a Quadrotor Using Switching Control". *Journal of Intelligent and Robotic Systems*, vol. 70, issue 1-4, pp. 65-78, April 2013.
- [15] L.R. García Carrillo, A. Dzul and R. Lozano. "Hovering quad-rotor control: A comparison of nonlinear controllers using visual feedback". *IEEE Transactions on Aerospace and Electronic Systems*, vol. 48, issue 4, pp. 3159-3170, October 2012.
- [16] L.R. García Carrillo, A. Dzul, R. Lozano and C. Pégard. "Combining Stereo Vision and Inertial Navigation System for a Quad-Rotor UAV". *Journal of Intelligent and Robotic Systems* vol. 65, issue 1-4, pp. 373-387, January 2012.
- [17] L.R. García Carrillo, E. Rondón, A. Sanchez, A. Dzul and R. Lozano. "Stabilization and trajectory tracking of a quad-rotor UAV using vision". *Journal of Intelligent and Robotic Systems*, vol. 61, issue 1-4, pp. 103-118, January 2011.
- [18] A. Sanchez, L.R. García Carrillo, E. Rondón, R. Lozano and O. García. "Hovering flight improvement of a quad-rotor mini UAV using brushless DC motors". *Journal of Intelligent and Robotic Systems*, vol. 61, issue 1-4, pp. 85-101, January 2011.

## Book Chapters

- [1] L.R. García Carrillo, J.A. Guerrero and R. Lozano. “Towards Vision based Coordination of Quadrotor Platoons”. In *UAV Flight Formation Control*, chapter 9, pp. 225-245, ISTE Ltd and John Wiley & Sons Inc., March 2012.
- [2] A. Sanchez, L.R. García Carrillo, E. Rondón and O. García. “Improving attitude stabilization of a quad-rotor using motor current feedback”. In *Unmanned Aerial Vehicles Embedded Control*, chapter 7, pp. 133-152, ISTE Ltd and John Wiley & Sons Inc., June 2010.

## Conference Publications

### Submitted / Under review / In preparation

- [1] C.E. Juarez Vargas, J. Surez Cansino, E.S.Espinoza Quesada, and L.R. Garcia Carrillo, “Implementation of an artificial neural network wavelet for payload transportation with two UAV agents”, December 2018.

### Accepted / Published

- [2] J. Xie, L. Jin, and L.R. Garcia Carrillo, “Optimal Path Planning for Unmanned Aerial Systems to Cover Multiple Regions”, AIAA Science and Technology Forum and Exposition, January 2019, San Diego CA, USA.
- [3] B. Wang, J. Xie, Y. Wan, G.A. Guijarro Reyes, and L.R. Garcia Carrillo, “3-D Trajectory Modeling for Unmanned Aerial Vehicles”, AIAA Science and Technology Forum and Exposition, January 2019, San Diego CA, USA.
- [4] J. Xie, L.R. Garcia Carrillo, and L. Jin. “An Integrated Traveling Salesman and Coverage Path Planning Problem for Unmanned Aircraft Systems”, The 57th IEEE Conference on Decision and Control, December 2018, Miami FL, USA.
- [5] M. Jafari, H. Xu, and L.R. Garcia Carrillo, “Brain Emotional Learning-Based Path Planning and Intelligent Control Co-Design for Unmanned Aerial Vehicle in Presence of System Uncertainties and Dynamic Environment”, 2018 IEEE Symposium Series on Computational Intelligence (SSCI), November 2018, Bengaluru, India.
- [6] P. Rangel and L.R. Garcia Carrillo. “Safety Bubble Control for Coordination of Multiple Unmanned Aircraft Systems”, IFAC Workshop on Networked & Autonomous Air & Space Systems NAASS 2018, June 2018, Santa Fe, New Mexico, USA.
- [7] G.A. Guijarro Reyes, L.R. Garcia Carrillo, and P. Rangel. “A Geometric Control Strategy for Real-Time Coordination of Multiple Unmanned Aircraft Systems”, 2018 International Conference on Unmanned Aircraft Systems, June 2018, Dallas, TX, USA
- [8] D. Valdenegro, A. Capunay, D. Gonzalez, L.R. Garcia Carrillo, and P. Rangel. “Improving Safety: Design and Development of a Bladeless Thruster for Autonomous Multicopters”, International Conference on Unmanned Aircraft Systems, June 2018, Dallas, TX, USA
- [9] N.S. Zuniga Pena, F. Munoz Palacios, M.A. Marquez Vera, E.S. Espinoza Quesada, and L.R. Garcia Carrillo. “Load Transportation Using Single and Multiple Quadrotor Aerial Vehicles with Swing Load Attenuation”, 2018 International Conference on Unmanned Aircraft Systems, June 2018, Dallas, TX, USA
- [10] P. Ordaz, E.S. Espinoza Quesada, F. Munoz Palacios, and L.R. García Carrillo, H. Romero, and R. Lozano. “Nonlinear Control and Trajectory Tracking of an Unmanned Aircraft System Based on a Complete State Space Representation”. IFAC Conference on Modeling, Identification and Control of Nonlinear Systems (MICNON), June 2018, Guadalajara, Mexico.

- [11] R.A. Barron Gomez, L.E. Ramos Velasco, E.S. Espinoza Quesada, and L.R. Garcia Carrillo. “Wavelet Neural Network PID Controller for a UAS Transporting a Cable-Suspended Load”, 20th IFAC World Congress, Toulouse, France, July 2017.
- [12] M. Jafari, R. Fehr, L.R. Garcia Carrillo, E.S. Espinoza Quesada, and H. Xu. “Implementation of Brain Emotional Learning-Based Intelligent Controller for Flocking of Multi-Agent Systems”, 20th IFAC World Congress, Toulouse, France, July 2017.
- [13] H. Xu, E.S. Espinoza Quesada, L.R. Garcia Carrillo, A. Frey, and F. Munoz Palacios, “Adaptive Model-Based Event-Triggered Consensus Control for Multi-Agent Systems with Unknown System Dynamics”, International Conference on Unmanned Aircraft Systems, Miami FL, June 2017.
- [14] R. Fehr, K. Boles, M. Jafari, H. Xu, L.R. Garcia Carrillo, “A Low-Computation Distributed Connectivity Control for Coordinated Multi-UAS”, International Conference on Unmanned Aircraft Systems, Miami FL, June 2017.
- [15] M. Jafari, R. Fehr, L.R. Garcia Carrillo, and H. Xu, “Brain Emotional Learning-Based Intelligent Tracking Control for Unmanned Aircraft Systems with Uncertain System Dynamics and Disturbance”, International Conference on Unmanned Aircraft Systems, Miami FL, June 2017.
- [16] H. Xu, and L.R. Garcia Carrillo. “Near Optimal Control and Network Co-design for Uncertain Networked Control System with Constraints”, 2017 American Control Conference, Seattle, Washington, USA, May 2017.
- [17] M. Jafari, H. Xu, and L.R. Garcia Carrillo. “Brain Emotional Learning-Based Intelligent Controller for Flocking of Multi-Agent Systems”, 2017 American Control Conference, Seattle, Washington, USA, May 2017.
- [18] J.H. Yoon, F. Morese, H. Xu, E.S. Espinoza Quesada, and L.R. García Carrillo. “Advanced Doppler Radar Physiological Sensing Technique for Drone Detection”, SPIE - Unmanned Systems Technology XIX, Anaheim, CA, USA, April 2017.
- [19] R.A. Barron Gomez, L.E. Ramos Velasco, E.S. Espinoza Quesada, and L.R. García Carrillo. “Model-free adaptive controller for autonomous aerial transportation of suspended loads with unknown characteristics”, SPIE - Unmanned Systems Technology XIX, Anaheim, CA, USA, April 2017.
- [20] H. Xu, and L.R. García Carrillo. “Distributed Optimal Flocking Design for Multi-Agent Two-Player Zero-Sum Games in presence of uncertain system dynamics and disturbances”, SPIE - Unmanned Systems Technology XIX, Anaheim, CA, USA, April 2017.
- [21] A. Frey, E.S. Espinoza Quesada, S. Lokhande, and L.R. García Carrillo, “RSSI-Based Relative Position Estimation of Cooperative Multiple-UAS”, ICUAS 2017: International Conference on Unmanned Aircraft Systems, Amsterdam, The Netherlands, May, 2017.
- [22] A.J. Munoz Palacios, F. Munoz Palacios, E.S. Espinoza Quesada, and L.R. García Carrillo, “Design, dynamic modeling, and control of an experimental platform of 3 DOF for applications of UASs”, XIII International Congress on Innovation and Technology Development (CIINDET), Cuernavaca, Morelos, Mexico, September 2016.
- [23] L.R. García Carrillo, F. Munoz Palacios, E.S. Espinoza Quesada, and K. Alexis, “Adaptive higher order sliding mode control for Relative-Positioning and Trajectory-Tracking of Spacecraft Formation-Flying”, Mediterranean Control Conference, Athens, Greece, June 2016.
- [24] C. Papachristos, K. Alexis, L.R. García Carrillo, and A. Tzes. “Distributed Infrastructure Inspection Path Planning for Aerial Robotics subject to Time Constraints”, International Conference on Unmanned Aircraft Systems, Arlington, VA, USA, June 2016.

- [25] G.E. Dimas Flores, E.S. Espinoza Quesada, S. Salazar, and L.R. García Carrillo. “UAS local path planning algorithm for outdoors obstacle avoidance based on attractive and repulsive potential fields”, International Conference on Unmanned Aircraft Systems, Arlington, VA, USA, June 2016.
- [26] G. Ortega Vargas, F. Munoz Palacios, E.S. Espinoza Quesada, L.R. García Carrillo, and P. Ordaz. “Implementation of Leader-Follower Linear Consensus Algorithm for Coordination of Multiple Aircrafts”, Research, Education and Development of Unmanned Aerial Systems, Cancun, MX, November 2015.
- [27] H. Xu, and L.R. García Carrillo. “Distributed Near Optimal Flocking Control for Multiple Unmanned Aircraft Systems”, International Conference on Unmanned Aircraft Systems, Denver, CO, June 2015.
- [28] F. Munoz Palacios, E.S. Espinoza Quesada, I. Gonzalez, L.R. García Carrillo, S. Salazar, and R. Lozano. “A UAS Obstacle Avoidance Strategy Based on Spiral Trajectory Tracking”, International Conference on Unmanned Aircraft Systems, Denver, CO, June 2015.
- [29] G. Ortega Vargas, C. Hintz, L.R. García Carrillo, F. Munoz Palacios, and E.S. Espinoza Quesada. “Dynamic Modeling of a Multi-Rotorcraft UAS with Morphing Capabilities”, International Conference on Unmanned Aircraft Systems, Denver, CO, June 2015.
- [30] Hao Xu, and L.R. García Carrillo. “Time-Based Finite-Horizon Near Optimal Design of Non-linear Two-Player Zero-Sum Game in presence of Completely Unknown Dynamics”. European Control Conference (ECC), 2015.
- [31] J.T. Isaacs, F. Qutin, L.R. García Carrillo, U. Madhow, and J.P. Hespanha. “Quadrotor Control for RF Source Localization and Tracking”. *The 2014 International Conference on Unmanned Aircraft Systems*, Orlando, FL, May 2014.
- [32] C. Hintz, C. Torno, and L.R. García Carrillo, “Design and dynamic modeling of a rotary wing aircraft with morphing capabilities”. *The 2014 International Conference on Unmanned Aircraft Systems*, (ICUAS 2014), Orlando, FL, May 2014.
- [33] C. Torno, C. Hintz, and L.R. García Carrillo, “Design and development of a semi-autonomous fixed-wing aircraft with real-time video feed”. *The 2014 International Conference on Unmanned Aircraft Systems*, (ICUAS 2014), Orlando, FL, May 2014.
- [34] L.R. García Carrillo and D. Um, “Unmanned Aircraft Systems Test Site Selection and UAV for next generation”. *International Conference and Exhibition on Mechanical & Aerospace Engineering*, (MECHAERO), San Antonio, TX, October 2013.
- [35] A. Ramírez, E.S. Espinoza, L.R. García Carrillo, S. Mondié, and R. Lozano. “Stability analysis of a vision-based UAV controller for autonomous road following missions”. *International Conference on Unmanned Aircraft Systems*, (ICUAS 2013), Atlanta, GA, May 2013.
- [36] K.G. Vamvoudakis, L.R. García Carrillo, and J.P. Hespanha. “Learning Consensus in Adversarial Environments”. *SPIE Defense, Security and Sensing*, Baltimore, Maryland, 2013. (invited paper)
- [37] L.R. García Carrillo, E.S. Espinoza Quesada and S. Mondié. “Controller’s parameters tuning in presence of time-delay measurements: an application to vision-based quad-rotor navigation”. In *IEEE Conference on Decision and Control (CDC 2012)*, pp. 5667-5672, Maui, Hawaii, USA, December 2012.
- [38] G. Flores, L.R. García Carrillo, G. Sanahuja and R. Lozano. “PID Switching Control for a Highway Estimation and Tracking Applied on a Convertible Mini-UAV”. In *IEEE Conference on Decision and Control (CDC 2012)*, pp. 3110-3115, Maui, Hawaii, USA, December 2012.

- [39] J.E. Gomez Balderas, G. Flores, L.R. García Carrillo, Rogelio Lozano and G. Sanahuja. “Tracking a Ground Moving Target with a Quadrotor Using Switching Control”. In *IEEE International Conference on Unmanned Aircraft Systems (ICUAS 2012)*, Philadelphia, PA USA, June 2012.
- [40] L.R. García Carrillo, G. Flores, G. Sanahuja and R. Lozano. “Quad-Rotor Switching Control: An Application for the Task of Path Following”. In *American Control Conference (ACC 2012)*, pp. 4637-4642, Montréal, Canada, June 2012.
- [41] J. Escareno, L.R. García Carrillo, C. Chauffaut, R. Lozano and V. Santibanez. “Nonholomic-Like Corridor Navigation of a Quad-Rotor MAV Using Optical Flow”. In *IFAC Conference on Embedded Systems, Computational Intelligence and Telematics in Control (CESCIT 2012)*, pp. 248-253, Wurzburg, Germany, April 2012.
- [42] L.R. García Carrillo, A. Dzul, and R. Lozano. “Comparison of different state estimation algorithms for quadrotor control”. In *Research, Development and Education on Unmanned Aerial Systems (RED-UAS 2011)*, Sevilla, Spain, December 2011.
- [43] L.R. García Carrillo, A. Dzul, R. Lozano and C. Pégard. “Combining Stereo Vision and Inertial Navigation System for a Quad-Rotor UAV”. In *2011 International Conference on Unmanned Aircraft Systems (ICUAS 2011)*, Denver, CO, USA. May 2011.
- [44] L.R. García Carrillo, E. Rondón, A. Dzul, A. Sanchez and R. Lozano. “Hovering quad-rotor control: A comparison of nonlinear controllers using visual feedback”. In *49th IEEE Conference on Decision and Control (CDC 2010)*, pp. 1662-1667, Atlanta, Georgia USA. December 2010.
- [45] E. Rondón, L.R. García Carrillo and I. Fantoni. “Vision-based altitude, position and speed regulation of a quad-rotor rotorcraft”. In *International Conference on Intelligent Robots and Systems (IROS 2010)*, pp. 628-633, Taipei, Taiwan. October 2010.
- [46] L.R. García Carrillo, Eduardo Rondon, Anand Sanchez, Alejandro Dzul and Rogelio Lozano. “Position control of a quad-rotor UAV using vision”. In *18th IFAC Symposium on Automatic Control in Aerospace (IFAC 2010)*, pp. 31-36, Nara, Japan. September 2010.
- [47] L.R. García Carrillo, E. Rondón, A. Sanchez, C. Pégard and R. Lozano. “Stabilization and trajectory tracking of a quad-rotor UAV using vision”. In *International Conference and Exhibition on Unmanned Aerial Vehicles (UAV 2010)*, Dubai, United Arab Emirates. June 2010.
- [48] A. Sanchez, L.R. García Carrillo, E. Rondón, R. Lozano and O. García. “Hovering flight improvement of a quad-rotor mini UAV using brushless DC motors”. In *International Conference and Exhibition on Unmanned Aerial Vehicles (UAV 2010)*, Dubai, United Arab Emirates. June 2010.
- [49] J.G. Castrejón Lozano, L.R. García Carrillo, A. Dzul and R. Lozano. “Spherical simplex sigma-point kalman filters: A comparison in the inertial navigation of a terrestrial vehicle”. In *American Control Conference (ACC 2008)*, pp. 3536-3541, Seattle, Washington, USA. June 2008.

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## INVITED TALKS

- “Brain Emotional Learning-Based Intelligent Controller for Multi-Agent Systems”, 2018 SACNAS National Conference. Invited session. San Antonio, TX, October 12, 2018.
- “Brain Emotional Learning-Based Intelligent Controller for Multi-Agent Systems”, Heudiasyc - University of Technology of Compiegne, June 29, 2018.



- “Brain Emotional Learning-Based Intelligent Controller for Multi-Agent Systems”, GIPSA LAB - University of Grenoble Alpes, June 26, 2018.
- “Brain Emotional Learning-Based Intelligent Controller for Multi-Agent Systems”, I3S Laboratory - University of Nice Sophia Antipolis, June 21, 2018.
- “Brain Emotional Learning-Based Intelligent Controller for Multi-Agent Systems”, CCDC - University of California Santa Barbara, May 18, 2018.
- “Unmanned Autonomous Systems - Opportunities and Challenges”, 2017 SACNAS National Conference. Invited session: “The Future Is Here and Changing Our Way of Life: Development and Applications of Unmanned Aircraft System Technology”, October 21, 2017.
- “Unmanned Autonomous Systems - Opportunities and Challenges”, 2017 Engineers Week, School of Engineering and Computing Sciences, Texas A&M University - Corpus Christi, February 22, 2017.
- “Heterogeneous Unmanned Vehicle Systems”, Department of Electrical Eng. and Computer Sciences, Technical University Ingolstadt, Ingolstadt, Germany, October 17, 2016.
- “Heterogeneous Unmanned Vehicle Systems”, Department of Electrical Eng. and Computer Sciences, Technical University Ingolstadt, Ingolstadt, Germany, October 17, 2016.
- “Unmanned Vehicle Systems”, Department of Mechatronics, Polytechnic University of Pachuca (UPP), Pachuca, Hidalgo, Mexico, September 22, 2016.
- “Unmanned Aircraft Systems”, Research for Undergraduates Summer Institute of Statistics at the University of Nevada, Reno (RUSIS@UNR), Mathematics & Statistics Department, University of Nevada, Reno, June 17, 2016.
- “Bio-inspired cooperative tactics for detection and tracking of dynamic assets”, Centre National de la Recherche Scientifique (CNRS), Paris, France, April 20, 2016.
- “Implications for Players in Tomorrow’s Mobility Ecosystem” in Exploring Tomorrow’s Automotive Mobility Ecosystem Session. The 2016 Consumer Electronics Show, Las Vegas, NV, January 8, 2016.
- “Unmanned Aircraft Systems: From Specialized Agents to Networked Societies”. IEEE MTT/IPS Chapter of Northern Nevada, Reno, NV, October 27, 2015.
- “Unmanned Aircraft Systems: From Specialized Agents to Networked Societies”. University of Nevada, Reno, NV, June 16, 2015.
- “Sensing and Control in Unmanned Systems”. Department of Electrical and Computer Eng., California State Polytechnic University - Pomona, Pomona CA, March 9, 2015.
- “Unmanned Aircraft Systems: From Specialized Agents to Intelligent Networked Societies”. Cyber-Physical Systems Seminar, Department of Electrical and Computer Engineering, University of New Mexico, Albuquerque NM, November 25, 2014.
- “Unmanned Aircraft Systems: From Specialized Agents to Intelligent Networked Societies”. The Institute of Electrical and Electronics Engineers Galveston Bay Section (IEEE-GBS). Gilruth Recreation Center NASA-JSC, Houston TX, November 21, 2014.
- “Unmanned Aircraft Systems: Surveillance, Security, and Privacy”. The Next Generation Project Texas Assembly. Organized by the Robert S. Strauss Center for International Security and Law at the University of Texas at Austin. Houston TX, January 31, 2014.
- “Vision-based Stabilization and Trajectory Tracking of Autonomous Agents”. Department of Electrical Engineering, New Mexico Tech. Socorro NM, April 4, 2013.
- “Stabilization and Trajectory Tracking of Autonomous Agents Equipped with Advanced Sensing and Actuation”. School of Engineering and Computing Sciences, Texas A&M University - Corpus Christi. Corpus Christi TX, March 22, 2013.

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## RESEARCH GRANTS

### • Current

- L.R. Garcia Carrillo (PI), “Multi-Agent Network Control - A Brain Emotional Learning-Inspired Approach”, Sponsored by Army Research Office - Network Sciences Division.

### • Submitted

- LD. Chen (PI), L.R. Garcia Carrillo (Co-PI), J. Xie (Co-PI), M. Starek (Co-PI), J. Jung (Co-PI), “CREST Center for Innovations Using Autonomous Systems for Extreme Conditions”, National Science Foundation (NSF), Submitted on December 2018.
- M. Starek (PI), L.R. Garcia Carrillo (Co-PI), “Equipment to Develop a Shallow Water Autonomous Tactical-Mapping Surface Vessel (SWAT-SV) for Advancing Maritime ISR Research”, Department of Defense (DoD), Submitted on October 2018.

### • Past

- D. Bridges (PI), L.R. Garcia Carrillo (Co-PI), “Unmanned Aircraft Systems Summer Institute”, Sponsored by The Texas Higher Education Coordinating Board (THECB), 2018. Funding: \$12,000 USD.
- D. Bridges (PI), L.R. Garcia Carrillo (Co-PI), “Unmanned Aircraft Systems Summer Institute”, Sponsored by The Texas Higher Education Coordinating Board (THECB), 2017. Funding: \$11,727 USD.
- E.S. Espinoza Quesada (PI, UPP, Mexico), L.R. Garcia Carrillo (Co-PI, UNR, USA), J.M. Rendon Mancha (Co-PI, UAEM, Mexico), “Development and implementation of advanced precision agriculture algorithms based on autonomous heterogeneous systems”, Sponsored by Mexican National Council of Science and Technology (CONACYT). Funding: \$75,000 USD. 2015-2018.
- K. Alexis (PI, UNR, USA), L.R. Garcia Carrillo (Co-PI, UNR, USA), L. Yliniemi (Co-PI, USA), R. Kelley (Co-PI, UNR, USA), “Autonomous Robotics Systems Arena”, Sponsored by Research Equipment Program, Office of the Vice President for Research and Innovation (VPRI), University of Nevada, Reno. Funding: \$100,000 USD. 2016.
- L.R. Garcia Carrillo, “Biologically-inspired cooperative tactics for UAS-based search and rescue operations”, Sponsored by Nevada Advanced Autonomous Systems Innovation Center (NAASIC), Funding: \$20,000 USD. 2016.
- L.R. Garcia Carrillo, “Sense and Avoid Strategies for Heterogeneous Multi-agent Systems”, Sponsored by TRDF Program Development Funding: \$20,000 USD. 2014.

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## PROFESSIONAL ACTIVITIES

### • Journal Editor Board Member

- Drones, Guest Editor of Special Issue “Fundamental and Applied Research in Unmanned Aircraft Systems Technology”, (2019)
- Mathematical Problems in Engineering, New York, USA, (2014 - present).

- Transactions on Machine Learning and Artificial Intelligence (TMLAI), Society for Science and Education, United Kingdom, (2014-present).
- Advances in Image and Video Processing (AIVP), Society for Science and Education, United Kingdom, (2014-present).
- Global Perspectives on Artificial Intelligence (GPAI), Indianapolis, USA, (2013-present).
- **Organization of Conferences and Workshops**
  - The *International Conference on Unmanned Aircraft Systems*, 2015 - present.
  - The *15 th International Conference on Control, Automation, Robotics and Vision (ICARCV)*, Marina Bay Sands Expo and Convention Centre, Singapore, November 18-21, 2018.
  - 12th International Symposium on Visual Computing, organizer of the Special Track 3: Advancing Autonomy for Aerial Robotics, Las Vegas, Nevada, USA, December 2016.
  - 3rd Workshop on *Research, Education and Development of Unmanned Aerial Systems*, Cancun, Mexico, November 2015.
  - *IEEE The 2014 IEEE GreenTech Conference*, Corpus Christi, TX, USA, April 2014.
  - *IEEE Multi-Conference on Systems and Control*, Hyderabad, India, 2013.
- **Reviewing and Paneling Activities**
  - NSF Pannel Review - Civil, Mechanical and Manufacturing Innovation (CMMI) 2018.
  - Member of the 2014-2015 Mexican National Council of Science and Technology (CONACYT) review panel for research projects in the area of Automation, Control and Robotics. CONACYT it is the equivalent of USA's National Science Foundation (NSF). CONACYT is the Mexican governmental organization that selects and distributes research funds in a large number of scientific fields of research.
- **Reviewer for Scholarly Publications**
  - **IEEE Transactions on:** Neural Networks and Learning Systems (2015-present); Robotics (2014-present); Control of Network Systems (2014-present); on Systems, Man and Cybernetics (2018-present); Automation Science and Engineering (2013-present); Signal Processing Letters (2013-present). **Elsevier:** Automatica (2014-present); Aerospace Science and Technology (2014-present); Robotics and Autonomous Systems (2013-present); Revista Iberoamericana de Automática e Informática Industrial (2013-present). **Springer:** Journal of Intelligent and Robotic Systems (2010-present); Nonlinear Dynamics (2015-present). **SAGE:** Transactions of the Institute of Measurement and Control (2014-present). **Hindawi:** Mathematical Problems in Engineering (2014-present). **Wiley:** Optimal Control, Applications and Methods (2013-present). Journal of Unmanned System Technology (2013-present). International Journal of Advanced Robotic Systems (2012-present). Journal of Mechanical Science and Technology (2011-present). Robotica (2011-present).
- **Reviewer for Technical Meetings and Conferences**
  - **IEEE:** Conference on Decision and Control; American Control Conference; Multi-Conference on Systems and Control; International Conference on Control and Automation; Mediterranean Conference on Control and Automation; International Conference

on Intelligent Robots and Systems, International Conference on Robotics and Automation; European Control Conference. **IFAC: World Congress**; Research, Education, and Development of Unmanned Aerial Systems (RED-UAS).

- **University Service**

- IEEE Chapter Adviser, Texas A&M University - Corpus Christi, 2018 - present.
- Society of Hispanic Professional Engineers (SHPE) Chapter Adviser, Texas A&M University - Corpus Christi, 2013 - present.
- International Education Committee - Texas A&M University - Corpus Christi, 2017 - present.
- Faculty Search Committee, Texas A&M University - Corpus Christi, 2013 - present.
- Adviser for the Unmanned Autonomous Systems Minor, @UNR.
- Secretary for The Northern Nevada Section of IEEE. Central Area, Region 6.
- Faculty Search Committee 2015, @UNR.
- Undergraduate/Graduate Curriculum, Texas A&M University - Corpus Christi.

- **Outreach Activities**

- Unmanned Aircraft Systems Summer Institute (Technical Director), Texas A&M University - Corpus Christi, TX, July 2018, July 2017.
- FIRST Tech Challenge Event, Texas A&M University - Corpus Christi, TX, 2013 - 2019.
- STEM Summer Institute: Robotics (Assistant Director), Texas A&M University - Corpus Christi, TX, 2014.

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## **RESEARCH ACTIVITIES COVERED BY MEDIA:**

- FOX News: “The Drones Are Coming: FAA-approved labs test UAVs for use in US skies” covered by John Roberts, Published April 22, 2014, [Click here](#).
- Caller Times: “TAMUCC gives drone demo”, Published February 20, 2014, [Click here](#).
- Aero News: New UAS Technology Could Turn The Industry On Its Side, Aircraft Under Development At Texas A&M University In Corpus Christi, Published November 17, 2014, [Click here](#).

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## **CURRENT STUDENTS**

- **Postdocs**

- Ignacio Rubio Scola. (Ph.D. from University of Grenoble, GIPSA-LAB, France, 2015). January 2019 - Present

- **Ph.D. Students**

- Lei Zhao, started CS Ph.D. at TAMU-CC during the Fall 2017

- **M.Sc. Students**

- Gabriel Alexis Guijarro Reyes, started CS M.Sc. at TAMU-CC during the Fall 2018. (Co-Advised with Dr. Junfei Xie). Scholarship fully supported by CONACYT - Mexico
- Lucas Dwyer, started CS M.Sc. at TAMU-CC during the Fall 2017. (Co-Advised with Dr. Junfei Xie)
- Mehmet Ozkan, started CS M.Sc. at TAMU-CC during the Spring 2017. (Co-Advised with Dr. Scott King)

## FORMER STUDENTS

- **Postdocs**

- Eduardo Steed Espinoza Quesada, (Ph.D. from CINVESTAV of the National Polytechnic Institute, Mexico 2011, and Currently Professor at CINVESTAV IPN, as of August 2017). Scholarship partially supported by CONACYT (Mexico) and Nevada Advanced Autonomous Systems Innovation Center (NAASIC). January 2016 - December 2016

- **Ph.D. Students**

- Mohammad Jafari, EE. University of Nevada, Reno, 2015 - 2017
  - \* Thesis: Distributed Control of Multi-Agent Systems using Biologically Inspired Reinforcement Learning
  - \* Co-advised with Dr. Hao Xu

- **M.Sc. Students**

- Evan Krell, CS, Texas A&M University - Corpus Christi, 2017 - 2018. (Co-Advised with Dr. Scott King)
- Arun Prassanth Ramaswamy Balasubramanian, CS, Texas A&M University - Corpus Christi 2016 -2018. (Co-Advised with Dr. Scott King)
- Shawn Browne, CS, Texas A&M University - Corpus Christi, TX, USA, 2014 - 2015. (Co-advised with Dr. Ahmed Mahdy.)

- **Undergraduate Students**

- Selena Mendoza (Honors Student), Texas A&M University - Corpus Christi, (2018).
- Daniel Valdenegro. Supported by the Louis Stokes Alliance for Minority Participation (LSAMP), Texas A&M University - Corpus Christi, (2017-2018).
- Christoph Hintz. Texas A&M University - Corpus Christi, (2013-2015). Currently Lead Robotics Software Engineer at Left Hand Robotics Longmont, Colorado.
- Ian Gates. Texas A&M University - Corpus Christi, (2014-2015). Currently Research Associate for the Texas A&M Natural Resources Institute, College Station, TX
- Jorge Contreras. Texas A&M University - Corpus Christi, (2014-2015)
- Cody Torno. Supported by the McNair Scholars Program, Texas A&M University- Corpus Christi (2013-2014). Currently an R&D Engineer, Bell Helicopter, Dallas, TX
- Brooke Lagunas. Supported by the Louis Stokes Alliance for Minority Participation (LSAMP), Texas A&M University - Corpus Christi, (2013-2014)

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**THESIS COMMITTEE**

- **Ph.D. Students**

- TBA.

- **M.Sc. Students**

- Angel Jose Munoz Palacios, Department of Mechatronics., Polytechnic University of Pachuca (UPP), Mexico. September 23, 2016.

- Md. Rashidul Hasan, Mathematics and Statistics Dept., University of Nevada Reno, USA. July 22, 2016.

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**SKILLS**

- **Software**

- Optimization: CVX (Matlab Software for Disciplined Convex Programming)

- Motion Capture Systems: Vicon Tracker, Optitrack.

- Computer Vision: Open CV

- Programming Languages: C, C++, Matlab, GNU Octave, LabView

- Robot Operating System (ROS)

- **Languages**

- English.

- French.

- Spanish (native).

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**REFERENCES****João Hespanha**

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