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Research interests:
Robotics, Motion Planning, Control Theory, Game Theory, Computational Geometry, Cyber-Physical Systems and Computer Vision. Applications to Pursuit/Evasion Games, Sensor-based Robot Navigation, Exploration of Unknown Environments and Object Search with Robots.

- **Education:**

Degree	Thesis/Dissertation	University	Date
Ph. D.	Robot Navigation and SLAM based on Computer Vision	"Institut National Polytechnique" (INPT) of Toulouse France	November 1998
D.E.A.*	Computer Vision for Outdoor Mobile Robots	INPT Toulouse France	September 1995
M. Sc.	The Color as a Symbolic Identifier	Tec de Monterrey, Campus Monterrey	December 1993
B. Sc. in Physics Engineering		Tec de Monterrey, Campus Monterrey	December 1990

∗ D.E.A. stands for "Diplôme d'Etudes a Profundies" Diploma of Advanced Studies, former postgraduate degree equivalent to a Master in France.

- **Experience:**

03/06 - present	Senior Research Scientist in the Mathematical Computing Group at the CIMAT – Center for Mathematical Research, México. Promoted to "Investigador Titular D", April 2024.
09/24 - present	Sabbatical leave at National Institute for Research in Digital Science and Technology, INRIA d'Université Côte d'Azur, Team ACENTAURI, France.
05/22 - 01/24	Head of postgraduate program in applied mathematics at CIMAT.
01/16 - 12/16	Sabbatical leave at the Siebel Center for Computer Science, University of Illinois at Urbana-Champaign, USA.
08/12 - 09/12	Short research stay at the Coordinated Science Laboratory of the University of Illinois at Urbana-Champaign, USA.
08/04 - 01/06	Professor and Director Mechatronics Center, Tec de Monterrey, campus Estado de México.
09/02-07/04	Postdoctoral Research Associate in the Beckman Institute and Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, USA.
01/00-07/02	Assistant Professor in the Electrical Engineering Department at Tec de Monterrey, campus of México City.
11/98 -12/99	Postdoctoral Research Affiliate in the Computer Science Department, Stanford University, USA.

04/96 -10/96	Visiting Ph.D. Student in the Computer Science Department, Stanford University, USA.
09/94 -11/98	Doctoral Student Researcher, in the "Groupe de Robotique et Intelligence Artificielle" (RIA) of the "Laboratoire d'Analyse et d'Architecture de Systèmes du Centre National de la Recherche Scientifique" (LAAS/CNRS), in Toulouse, France.
08/91-12/93	Master Student and Research Assistant at Tec de Monterrey, campus Monterrey, Center of Artificial Intelligence and Center of Integrated Manufacturing Systems, México.

- **Ph.D. Thesis Supervision:**

  - Eliezer Lozano Trejo, Optimal sampling based motion planning: Applications to sensor-based navigation and pursuit-evasion, February 2024, co-advised with Dr. Ubaldo Ruiz, CICESE.

  - Eleazar Peralta, Design of a stereoscopic vision system for navigation of a terrestrial autonomous vehicle, November 2023, co-advised with Dr. Alejandro Barranco Tec Celaya.

  - Gabriel Aguilar Mendoza, Multi-robot exploration and semantic map building: Distributed algorithms and heterogeneous agents, July 2021, co-advised with Dr. Israel Becerra CIMAT.

  - Omar Vladimir Macías Sandoval, Pursuit-evasion and navigation control based on observations, February 2020.

  - Heikel Yervilla Herrera, Optimal Sampling-based Motion Planning with Applications to Non-holonomic Dynamical Systems Under Visibility Constraints and Object Reconstruction, November 2019, co-advised with Dr. L. Enrique Sucar INAOE.

  - Edgar Martínez Rodríguez, A Motion Strategy for Exploration Driven by an Automaton Activating Feedback-based Controllers, November 2018, co-advised with Dr. Hector Becerra CIMAT.

  - Hugo Carlos Martínez, Algorithms of optimal control for problems of robot navigation with uncertainty, April 2018, co-advised with Dr. Jean-Bernard Hayet CIMAT.

  - Israel Becerra Duran, Problems of Search and Pursuit-Evasion for Mobile Robots, April 2015.

  - Luis Manuel Valentín Coronado, Motion Planning for Exploration and Map Building Under Uncertainty with Multiple-Heterogeneous Robots, December 2014.

  - Irving Vasquez Gómez, INAOE student, View Planning for 3D Object Reconstruction with a Mobile Manipulator Robot, December 2014, co-advised with Prof. Enrique Sucar INAOE.

  - Rigoberto López Padilla, Optimal Gap Navigation for a Differential Drive Disc Robot, April 2014, co-advised with Prof. Victor Ayala U.G. Salamanca.

  - Ubaldo Ruiz López, Pursuit-Evasion Problems with a Differential Drive Robot and an Omni-directional Agent, January. 2013.

  - Judith Espinoza León, Object Search with a Mobile Manipulator Robot in 3-D Environments, Ph.D. August 2012.

  - Lourdes Muñoz Gómez, Exploration and Map Building with Multiple-Robots, Ph.D. December. 2007.

  - Moíses Alencastre Miranda, Robot Navigation Under Uncertainty, Ph.D. December. 2007.

- **M.Sc. Thesis Supervision:**

  – Emil Fouad Awad Valdés, Car Trajectories in the Presence of Obstacles Using the RRT* Algorithm, Decembre 2024, co-advised with Dr. Thomas Batard, CIMAT.

  - Mónica Anahí Rodríguez Ortiz, Chain Flocking: Multi-Agent Navigation in Unknown Environments with Local Measurements, August 2024, co-advised with Dr. Hector Becerra CIMAT.

  - Angelo David Espinoza Valarezo, Robot Motion Planning with Sensory Feedback, April 2024, co-advised with Dr. Israel Becerra CIMAT.

  - Emmanuel Antonio Cuevas, Approximate Methods for Pursuit-Evasion, May 2023, co-advised with Dr. Israel Becerra CIMAT.

  - José Gonzalo Palomares Gutiérrez, Inference Neural Networks for Motion Planning with Dynamical Systems, January 2023, co-advised with Dr. Israel Becerra CIMAT.

  - Ramsés Adalid Reyes Beltrán, Visual-RRT: A Feedback-based Motion Strategy for a Car-like Robot, November 2021, co-advised with Dr. Seth Hutchinson, Georgia Tech.

  - David Cardona Montoya, A Pursuer Active Strategy to Maintain Visibility of a Moving Evader, March 2021, co-advised with Dr. Israel Becerra CIMAT.

  - Richard Fabian Arteaga Ospina, An Efficient SST Planner for Minimum Time Trajectories for a DDR with Second Order Dynamics among Obstacles, Nov. 2020, co-advised with Dr. Israel Becerra CIMAT.

  - Luis Daniel Bravo Ramírez, Time-Optimal Motion Strategies for a Pursuit-Evasion Game Between Two Identical Differential Drive Robots, Nov. 2019, co-advised with Dr. Ubaldo Ruiz CICESE.

  - José David Jacobo Guillen, Visual Feedback-based Time-Optimal Motion Strategies for Capturing an Unpredictable Evader, Nov. 2013, co-advised with Dr. Hector Becerra CIMAT.

  - Guillermo Laguna Mosqueda, Exploration of an Unknown Environment with a Differential Drive Disc Robot, Oct. 2013, co-advised with Dr. Hector Becerra CIMAT.

  - Israel Becerra Durán, Pursuit-Evasion Problems Under Incomplete Information with Mobile Robots, Oct. 2010.

  - Juan Pablo García Gudiño, Pursuit-Evasion Problems with Mobile Robots, May 2008.

- **Postdoctoral Research Associate:**

  – Gabriel Flores-Aquino
  Project: Pursuit-evasion with optimal control and learning.

- **Current Ph.D. Students:**

  - Jorge Eduardo Gutiérrez Gómez, Learning Manipulation Tasks: A multi-agent approach.
  - Ramsés A. Reyes Beltrán, Vision-based controllers for generating ssymptotically optimal trajectories.

- **Current M.Sc. Students:**

  - José Francisco Ambríz Gutiérrez, Feedback-based Optimal Navegation for a Car-like Robot.

- **Selected Journal Publications:**

54. Gabriel Aguilar, Israel Becerra and Rafael Murrieta-Cid, Multi-Robot Exploration and Semantic Map Building: Heterogeneous Terrestrial Robots and a Drone, *Accepted to Inteligencia Artificial, Iberoamerican Journal of Artificial Intelligence*, 2025.

53. Luis E. Ruiz-Fernandez, Javier Ruiz-Leon, David Gomez-Gutierrez and Rafael Murrieta-Cid, Decentralized multi-robot formation control in environments with non-convex and dynamic obstacles based on path planning algorithms, *Journal of Intelligent Service Robotics*, Vol 18. No. 2, pages 215-232, 2025.
Link to the paper, DOI: https://doi.org/10.1007/s11370-024-00582-x

52. Emmanuel Antonio, Israel Becerra and Rafael Murrieta-Cid, Approximate Methods for Visibility-based Pursuit-Evasion, *IEEE Transactions on Robotics* Vol. 40, pages 4768-4786, 2024.
Link to the paper, DOI: 10.1109/TRO.2024.3474948

51. Jose-Eleazar Peralta-Lopez, Emmanuel Antonio, Israel Becerra, Alejandro-Israel Barranco-Gutierrez and Rafael Murrieta-Cid, Learning Terrain Traversability for a Mobile Robot based on Information Fusion, *Inteligencia Artificial, Iberoamerican Journal of Artificial Intelligence*, Vol. 28, No. 75, Pages, 1-14, June 2025.
Link to the paper, DOI: https://doi.org/10.4114/intartif.vol28iss75

50. Edgar Martinez, Rafael Murrieta-Cid, Hector M. Becerra and Israel Becerra, Feasible Minimum Distance Feedback-based-Navigation for a Differential Drive Robot in an Environment with Obstacles, *Journal of the Franklin Institute*, Vol. 361, No. 18, 107253, 2024. Link to the paper, DOI: https://doi.org/10.1016/j.jfranklin.2024.107253

49. Eliezer Lozano, Israel Becerra, Ubaldo Ruiz and Rafael Murrieta-Cid, On the Terminal Conditions of the Two Cutters and a Fugitive Ship Differential Game with Non-Zero Capture Radius and Different Players' Speed Ratio, *IFAC Journal of Systems and Control*, Vol. 29, 100273, 2024. Link to the paper, DOI: https://doi.org/10.1016/j.ifacsc.2024.100273

48. Rafael Peralta, Israel Becerra, Ubaldo Ruiz and Rafael Murrieta-Cid, A Methodology for Generating Driving Styles for Autonomous Cars, *Journal of Intelligent Transportation Systems*, Vol. 28, No. 1, pages 120-140, 2024.
Link to the paper, DOI: https://doi.org/10.1080/15472450.2022.2109417

47. Gonzalo Palomares, Israel Becerra and Rafael Murrieta-Cid, Control Inference Neural Network for Motion Planning with Dynamical Systems, *IEEE Robotics and Automation Letters*, Vol. 8, No. 12, pages 8224-8231, 2023.
Link to the paper, DOI: 10.1109/LRA.2023.3327018

46. Katherine J. Mimnaugh, Evan G. Center, Markku Suomalainen, Israel Becerra, Eliezer Lozano, Rafael Murrieta-Cid, Timo Ojala, Steven LaValle and Kara D. Federmeier, Virtual Reality Sickness Reduces Attention During Immersive Experiences, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 29, No. 11, pages 4394-4404, 2023.
Link to the paper, DOI: 10.1109/TVCG.2023.3320222

45. Ramses Reyes, Israel Becerra, Rafael Murrieta-Cid and Seth Hutchinson, Visual-RRT: Integrating IBVS as a Steering Method in an RRT Planner, *Robotics and Autonomous Systems*, Vol 169, 104525, 2023.
Link to the paper, DOI:https://doi.org/10.1016/j.robot.2023.104525

44. Edgar Martinez, Rafael Murrieta-Cid and Hector M. Becerra, An Automaton and Super-Twisting Sliding-Mode Control for Wall Following, *Journal of Control Engineering and Applied Informatics*, Vol 25, No. 2, pages 3-12, 2023.
Link to the paper, http://www.ceai.srait.ro/

43. David Cardona, Israel Becerra and Rafael Murrieta-Cid, On the equivalence of pursuer strategies and the lack of Nash equilibrium in a visibility pursuit-evasion game, *Journal of the*

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Franklin Institute, Engineering and Applied Mathematics, Vol. 359, No. 18, pages 10420-10454, 2022.
Link to the paper, DOI: https://doi.org/10.1016/j.jfranklin.2022.10.030

42. Heikel Yervilla-Herrera, Israel Becerra, Rafael Murrieta-Cid, L. Enrique Sucar and Eduardo F. Morales, Bayesian Probabilistic Stopping Test and Asymptotic Shortest Time Trajectories for Object Reconstruction with a Mobile Manipulator Robot, *Journal of Intelligent and Robotic Systems*, Vol. 105, No. 4, pages 1-17, 2022.
Link to the paper, DOI: https://doi.org/10.1007/s10846-022-01696-z

41. Eliezer Lozano, Ubaldo Ruiz, Israel Becerra and Rafael Murrieta-Cid, Surveillance and Collision-free Tracking of an Aggressive Evader with an Actuated Sensor Pursuer, *IEEE Robotics and Automation Letters*, Vol. 7, No. 3, pp. 6854-6861, 2022.
Link to the paper, DOI: 10.1109/LRA.2022.3178799

40. Israel Becerra, Heikel Yervilla-Herrera, Emmanuel Antonio and Rafael Murrieta-Cid, On the Local Planners in the RRT* for Dynamical Systems and their Reusability for Compound Cost Functionals, *IEEE Transactions on Robotics*, Vol. 32, No. 2, pp. 887-905, 2022.
Link to the paper, DOI: https://doi.org/10.1109/TRO.2021.3098244

39. Eliezer Lozano, Israel Becerra, Ubaldo Ruiz, Luis Bravo and Rafael Murrieta-Cid, A Visibility-based Pursuit-Evasion Game between Two Nonholonomic Robots in Environments with Obstacles, *Autonomous Robots*, Vol. 46, No. 2, pp. 349-371, 2022.
Link to the paper, DOI: https://doi.org/10.1007/s10514-021-10026-5

38. Richard Arteaga, Emmanuel Antonio, Israel Becerra, Rafael Murrieta-Cid, On the Efficiency of the SST Planner to Find Time Optimal Trajectories among Obstacles with a DDR under Second Order Dynamics, *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 674-681, 2022.
Link to the paper, DOI: https://ieeexplore.ieee.org/document/9640450

37. Eduardo F. Morales, Rafael Murrieta-Cid, Israel Becerra, Marco A. Esquivel-Basaldua, A Survey on Deep Learning and Deep Reinforcement Learning in Robotics with a Tutorial on Deep Reinforcement Learning, *Journal of Intelligent Service Robotics*, vol. 17, no. 5, pp. 773-805, 2021.
Link to the paper, DOI: https://link.springer.com/article/10.1007/s11370-021-00398-z

36. Javier Gonzalez-Trejo, Diego Mercado-Ravell, Israel Becerra and Rafael Murrieta-Cid, On the Visual-based Safe Landing of UAVs in Populated Areas: a Crucial Aspect for Urban Deployment, *IEEE Robotics and Automation Letters*, vol. 6, no. 4, pp. 7901-7908, Oct. 2021
Link to the paper, DOI: https://doi.org/10.1109/LRA.2021.3101861

35. Vladimir Macias, Israel Becerra, Edgar Martinez, Rafael Murrieta-Cid and Hector M. Becerra, Single Landmark Feedback based Time Optimal Navigation for a Differential Drive Robot, *Journal of the Franklin Institute, Engineering and Applied Mathematics*, Vol. 358, No. 9, pages 4761-4792, 2021.
Link to the paper, DOI: https://doi.org/10.1016/j.jfranklin.2021.04.015

34. J. Irving Vasquez-Gomez, David E. Troncoso Romero, Israel Becerra, Enrique Sucar and Rafael Murrieta-Cid, Next-best-view Regression using a 3D Convolutional Neural Network, *Machine Vision and Applications*, Vol. 32, No. 42, pages 1-14, 2021.
Link to the paper, DOI: https://doi.org/10.1007/s00138-020-01166-2

33. Israel Becerra, Markku Suomalainen, Eliezer Lozano, Katherine J. Mimnaugh, Rafael Murrieta-Cid and Steven M. LaValle, Human Perception-Optimized Planning for Comfortable VR-Based Telepresence, *IEEE Robotics and Automation Letters*, Vol. 5, No. 4, pages 6489-6496, 2020.
Link to the paper, DOI: 10.1109/LRA.2020.3015191

32. Luis Bravo, Ubaldo Ruiz and Rafael Murrieta-Cid, A Pursuit-Evasion Game between Two Identical Differential Drive Robots, *Journal of the Franklin Institute, Engineering and Applied*

Mathematics, Vol. 357, No. 10, pages 5773-5808, 2020.
Link to the paper, DOI: https://doi.org/10.1016/j.jfranklin.2020.03.009

31. Ramses Reyes and Rafael Murrieta-Cid, An Approach Integrating Planning and Image Based Visual Servo Control for Road Following and Moving Obstacles Avoidance, *International Journal of Control*, Vol. 93, No. 10, pages 2442-2456, 2020.
Link to the paper, DOI: https://doi.org/10.1080/00207179.2018.1562225

30. Edgar Martinez, Guillermo Laguna, Rafael Murrieta-Cid, Hector M. Becerra, Rigoberto Lopez-Padilla and Steven M. LaValle, A Motion Strategy for Exploration Driven by an Automaton Activating Feedback-based Controllers, *Journal Autonomous Robots*, Volumen 43, No. 7, pages 1801-1825, 2019.
Link to the paper, DOI: https://doi.org/10.1007/s10514-019-09835-6

29. Rigoberto Lopez-Padilla and Rafael Murrieta-Cid, Maintaining Visibility of a Landmark using Optimal Sampling-based Path Planning, *Journal Computación y Sistemas*, Volumen 23, No. 4, pages 1357-1373, 2019.
Link to the paper, DOI: 10.13053/CyS-23-4-2983

28. Gabriel Aguilar, Luis Bravo, Ubaldo Ruiz, Rafael Murrieta-Cid and Edgar Chavez, A Distributed Algorithm for Exploration of Unknown Environments with Multiple Robots, *Journal of Intelligent and Robotic Systems*, Volumen 95, No. 3-4, pages 1021-1040, 2019.
Link to the paper, DOI: https://doi.org/10.1007/s10846-018-0939-9

27. Heikel Yervilla-Herrera, Irving Vasquez, Rafael Murrieta-Cid, Israel Becerra and Enrique Sucar, Optimal Motion Planning and Stopping Test for 3-D Object Reconstruction, *Journal of Intelligent Service Robotics*, Volumen 12, No. 1, pages 103-123, 2019.
Link to the paper, DOI: 10.1007/s11370-018-0264-y

26. Vladimir Macias, Israel Becerra, Rafael Murrieta-Cid, Hector M. Becerra and Seth Hutchinson, Image Feedback based Optimal Control and the Value of Information in a Differential Game, *Journal Automatica*, Vol 90, pages 271-285, April, 2018.
Link to the paper, DOI: 10.1016/j.automatica.2017.12.045

25. Irving Vasquez, L. Enrique Sucar, Rafael Murrieta-Cid and Juan-Carlos Herrera-Lozada, Tree Based Search of the Next Best View/State for 3D Object Reconstruction, *International Journal of Advanced Robotic Systems*, Volume 15, Issue 1, January-February 2018.
Link to the paper, DOI: 10.1177/1729881418754575

24. Hugo Carlos-Martinez, Jean-Bernard Hayet and Rafael Murrieta-Cid, An Analysis of Policies from Stochastic Linear Quadratic Gaussian in Robotics Problems with State- and Control-Dependent Noise, *Journal of Intelligent and Robotic Systems*, Vol. 92, No. 1, pages 85-106, 2018.
Link to the paper, DOI: 10.1007/s10846-017-0736-x

23. Rigoberto Lopez-Padilla, Rafael Murrieta-Cid, Israel Becerra, Guillermo Laguna and Steven M. LaValle, Optimal Navigation for a Differential Drive Disc Robot: A Game Against the Polygonal Environment, *Journal of Intelligent and Robotic Systems*, special issue on Motion Strategies, Vol. 89, No. 1-2, pages 211-250, 2018.
Link to the paper, DOI: 10.1007/s10846-016-0433-1

22. Irving Vasquez, Enrique Sucar and Rafael Murrieta-Cid, View/State Planning for Three-dimensional Object Reconstruction under Uncertainty, *Journal Autonomous Robots*, Vol. 41, No. 1, pages 89-109, 2017.
Link to the article in the journal, DOI: 10.1007/s10514-015-9531-3

21. Ubaldo Ruiz and Rafael Murrieta-Cid, A differential pursuit/evasion game of capture between an omnidirectional agent and a differential drive robot, and their winning roles, *International Journal of Control*, Vol 89, No 11, pages 2169-2184, 2016.
Link to the article in the journal, DOI: 10.1080/00207179.2016.1151078

20. Israel Becerra, Luis M. Valentín-Coronado, Rafael Murrieta-Cid and Jean-Claude Latombe, Reliable Confirmation of an Object Identity by a Mobile Robot: A Mixed Appearance/Localization-Driven Motion Approach, *International Journal of Robotics Research*, Vol 35, No 10, pages 1207-1233, 2016.
    Link to the article in the journal, DOI: 10.1177/0278364915620848

19. Israel Becerra, Rafael Murrieta-Cid, Raul Monroy, Seth Hutchinson and Jean-Paul Laumond, Maintaining Strong Mutual Visibility of an Evader Moving over the Reduced Visibility Graph, *Journal Autonomous Robots*, Vol 40, No 2, pages 395-423, February 2016.
    Link to the article in the journal, DOI: 10.1007/s10514-015-9477-5

18. David Jacobo, Ubaldo Ruiz, Rafael Murrieta-Cid, Hector Becerra and Jose Luis Marroquin, A Visual Feedback-based Time-Optimal Motion Policy for Capturing an Unpredictable Evader, *International Journal of Control*, Vol 88, No 4, pages 663-681, March 2015.
    Link to the article in the journal, DOI:10.1080/00207179.2014.971434

17. Judith Espinoza and Rafael Murrieta-Cid, Saving Time for Object Finding with a Mobile Manipulator Robot in 3-D Environment, *Computación y Sistemas*, Vol 19, No 1, pages 29-45, January 2015.
    Link to the article in the journal, DOI: 10.13053/CyS-19-1-1910

16. Irving Vasquez, Enrique, Sucar, Rafael Murrieta-Cid and Efrain Lopez, Volumetric Next-Best-View Planning for 3D Object Reconstruction with Positioning Error, *International Journal of Advanced Robotic Systems*, Vol 11, No 159, pages 1-13, October 2014.
    Link to the article in the journal, DOI: 10.5772/58759

15. Luis Valentin, Rafael Murrieta-Cid, Lourdes Muñoz, Rigoberto López-Padilla and Moises Alencastre, Motion Strategies for Exploration and Map-Building under Uncertainty with Multiple Heterogeneous Robots, *Journal Advanced Robotics*, Vol 28, No 17, pages 1133-1149, July 2014.
    Link to the article in the journal, DOI:10.1080/01691864.2014.914015

14. Ubaldo Ruiz, Jose Luis Marroquin and Rafael Murrieta-Cid, Tracking an Omnidirectional Evader with a Differential Drive Robot at Bounded Variable Distance, *International Journal of Applied Mathematics and Computer Science*, Vol 24, No 2, pages 371-385, June 2014.
    [Link to the article in the journal, DOI: 10.2478/amcs-2014-0028

13. Jean-Bernard Hayet, Hugo Carlos, Claudia Esteves and Rafael Murrieta-Cid, Motion Planning for Maintaining Landmarks Visibility with a Differential Drive Robot, *Journal Robotics and Autonomous Systems*, Vol. 62, No. 4, pages 456-473, April 2014.
    Link to the article in the journal, DOI:10.1016/j.robot.2013.12.003

12. Ubaldo Ruiz, Rafael Murrieta-Cid and José Luis Marroquin, Time-Optimal Motion Strategies for Capturing an Omnidirectional Evader using a Differential Drive Robot, *IEEE Transactions on Robotics*, Vol. 29, No. 5, pages 1180-1196, October 2013.
    Link to the article in the journal, DOI:10.1109/TRO.2013.2264868

11. Rafael Murrieta-Cid, Ubaldo Ruiz, José Luis Marroquin, Jean-Paul Laumond and Seth Hutchinson, Tracking an Omnidirectional Evader with a Differential Drive Robot, *Journal Autonomous Robots*, special issue on Search and Pursuit/Evasion with Mobile Robots, Vol. 31, No. 4, pages 345-366, November 2011.
    Link to the article in the journal, DOI:10.1007/s10514-011-9246-z

10. Judith Espinoza, Alejandro Sarmiento, Rafael Murrieta-Cid and Seth Hutchinson, Motion Planning Strategy for Finding an Object with a Mobile Manipulator in Three-Dimensional Environments, *Journal Advanced Robotics*, Vol. 25, No. 13-14, pages 1627-1650, August 2011.
    Link to the article in the journal, DOI:10.1163/016918611X584613

9. Alejandro Sarmiento, Rafael Murrieta-Cid and Seth Hutchinson, An Efficient Motion Strategy to Compute Expected-Time Locally Optimal Continuous Search Paths in Known Environments, *Journal Advanced Robotics*, Vol. 23, No. 12-13, pages 1533-1560, October 2009.
    Link to the article in the journal, DOI:10.1163/016918609X12496339799170

8. Benjamín Tovar, Rafael Murrieta-Cid and Steven LaValle, Distance-Optimal Navigation in an Unknown Environment without Sensing Distances, *IEEE Transactions on Robotics*, Vol. 23, No. 3, pages 506-518, June 2007.
Link to the article in the journal, DOI:10.1109/TRO.2007.898962

7. Rafael Murrieta-Cid, Teja Muppirala, Alejandro Sarmiento, Sourabh Bhattacharya and Seth Hutchinson, Surveillances Strategies for a Pursuer with Finite Sensor Range, *International Journal of Robotics Research*, Vol. 26, No. 3, pages 233-253, March 2007.
Link to the article in the journal, DOI:10.1177/0278364907077083

6. Sourabh Bhattacharya, Rafael Murrieta-Cid and Seth Hutchinson, Optimal Paths for Landmark-based Navigation by Differential Drive Vehicles with Field-of-View Constraints, *IEEE Transactions on Robotics*, Vol. 23, No. 2, Pages 47-59, February 2007.
Link to the article in the journal, DOI:10.1109/TRO.2006.886841

5. Benjamín Tovar, Lourdes Muñoz-Gómez, Rafael Murrieta-Cid, Moíses Alencastre-Miranda, Raúl Monroy and Seth Hutchinson, Planning Exploration Strategies for Simultaneous Localization and Mapping, *Journal Robotics and Autonomous Systems*, Vol. 54, No. 4, pages 314-331, April 2006.
Link to the article in the journal, DOI:10.1016/j.robot.2005.11.006

4. Rafael Murrieta-Cid, Benjamín Tovar and Seth Hutchinson, A Sampling-Based Motion Planning Approach to Maintain Visibility of Unpredictable Targets, *Journal Autonomous Robots*, Vol. 19, No. 3, pages 285-300, Decembrer 2005.
Link to the article in the journal, DOI:10.1007/s10514-005-4052-0

3. Rafael Murrieta-Cid, Carlos Parra and Michel Devy, Visual Navigation in Natural Environments: From Range and Color Data to a Landmark-based Model, *Journal Autonomous Robots*, Vol. 13, No. 2, pp. 143-168, September 2002.
Link to the article in the journal, DOI:10.1023/A:1019685425452

2. Rafael Murrieta-Cid, Maurice Briot, Batiste Marcel and Héctor González, "Aspectos Dinámicos de la Visión: Seguimiento de Objetos No Rígidos y Estimación de la Rotación de una Cámara", Journal Computación y Sistemas, Vol. 1 No. 4, pages 201-212, 1998.
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1. Baptiste Marcel, Maurice Briot and Rafael Murrieta-Cid, "Calcul de Translation et Rotation par la Transformation de Fourier", *Journal "Traitement du Signal"*, Vol. 14, No. 2, pages 135-149, 1997.
Link to the article in the journal, URI: https://www.iieta.org/journals/ts/paper/10.3166/ts.14.135-149

- **Selected Chapters in Collections:**

  7. Markku Suomalainen, Katherine J. Mimnaugh, Israel Becerra, Eliezer Lozano, Rafael Murrieta-Cid and Steven M. LaValle, Comfort and Sickness While Virtually Aboard an Autonomous Telepresence Robot. In: Bourdot P., et al. (eds) Virtual Reality and Mixed Reality. EuroXR 2021. Lecture Notes in Computer Science, vol 13105. Springer, Cham. 2021.
  Link to the chapter https://doi.org/10.1007/978-3-030-90739-6_1

  6. Israel Becerra, Heikel Yervilla-Herrera and Rafael Murrieta-Cid, An Experimental Analysis on the Necessary and Sufficient Conditions for the RRT* Applied to Dynamical Systems, *Proc 13th International Workshop on the Algorithmic Foundations of Robotics, WAFR 2018*, Mérida México, *Morales M., Tapia L., Sánchez-Ante G., Hutchinson S. (eds), Springer Proceedings in Advanced Robotics*, Vol. 14, Springer, Cham, pages 835-851, 2020.
  Link to the chapter https://doi.org/10.1007/978-3-030-44051-0_48

  5. Rigoberto López, Rafael Murrieta-Cid and Steven M. LaValle, Optimal Gap Navigation for a Disc Robot, *Proc Tenth International Workshop on the Algorithmic Foundations of Robotics,*

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2. Nicolas Vandapel, Stewart Moorehead, William Whittaker, Raja Chatila and Rafael Murrieta-Cid, Preliminary Results on the Use of Stereo, Color Cameras and Laser Sensors in Antarctica, *Proc Sixth International Symposium on Experimental Robotics ISER 1999*, Sydney, Australia, *P. I. Corke and J. Trevelyan (Eds.), Lecture Notes in Control and Information Sciences* Vol. 250, pages 59-68, Springer 2000.
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1. Carlos Parra, Rafael Murrieta-Cid, Michel Devy and Maurice Briot, 3-D Modeling and Robot Localization from Visual and Range Data in Natural Scenes. Computer Vision Systems, *Proc First International Conference on Computer Vision Systems, ICVS 1999*, Las Palmas, Gran Canaria, Spain, *H. I. Christensen (Eds.), Lecture Notes in Computer Science* Vol. 1542, pages 450-468, Springer 1999.
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- **Selected Conference Publications:**

26. Katherine J. Mimnaugh, Markku Suomalainen, Israel Becerra, Eliezer Lozano, Rafael Murrieta-Cid and Steven M. LaValle, Analysis of User Preferences for Robot Motions in Immersive Telepresence, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2021)*, pages 4252-4259, Prague, Czech Republic, 2021.
Link to the paper in IEEE Xplore, DOI: 10.1109/IROS51168.2021.9636852

25. Hugo Carlos, Jean-Bernard Hayet and Rafael Murrieta-Cid, Regression-based Linear Quadratic Regulator, *Proc IEEE International Conference on Robotics and Automation (ICRA 2018)*, pages 3001-3006, Brisbane, Australia 2018.
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24. Luis Bravo, Ubaldo Ruiz, Rafael Murrieta-Cid, Gabriel Aguilar and Edgar Chavez, A distributed exploration algorithm for unknown environments with multiple obstacles by multiple robots, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2017)*, pages 4460-4466, Vancouver, Canada, 2017.
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23. Israel Becerra, Vladimir Macias and Rafael Murrieta-Cid, On the Value of Information in a Differential Pursuit-Evasion Game, *Proc IEEE International Conference on Robotics and Automation (ICRA 2015)*, pages 4768-4774, Seattle Washington, USA 2015.
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22. Irving Vasquez, Luis Enrique Sucar and Rafael Murrieta-Cid, View Planning for 3D Object Reconstruction with a Mobile Manipulator Robot, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014)*, pages 4227-4333, Chicago USA, 2014.
Link to the paper in IEEE Xplore, DOI: 10.1109/IROS.2014.6943158

21. Israel Becerra, Luis M. Valentín-Coronado, Rafael Murrieta-Cid and Jean-Claude Latombe, Appearance-based Motion Strategies for Object Detection, *Proc IEEE International Conference on Robotics and Automation (ICRA 2014)*, pages 6455-6461, Hong Kong, China, 2014.
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20. Guillermo Laguna, Rafael Murrieta-Cid, Hector M. Becerra, Rigoberto Lopez-Padilla and Steven M. LaValle, Exploration of an Unknown Environment with a Differential Drive Disc Robot, *Proc IEEE International Conference on Robotics and Automation (ICRA 2014)*, pages 2527-2533, Hong Kong, China, 2014.
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18. Judith Espinoza and Rafael Murrieta-Cid, Repairing Plans for Object Finding in 3-D Environments, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011)*, pages 4528-4535, San Francisco California, USA, 2011.
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17. Lourdes Muñoz, Moises Alencastre, Rigoberto López and Rafael Murrieta-Cid, Exploration and Map-Building under Uncertainty with Multiple Heterogeneous Robots, *Proc IEEE International Conference on Robotics and Automation (ICRA 2011)*, pages 2295-2301, Shanghai China, 2011.
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16. Israel Becerra, Rafael Murrieta-Cid and Raul Monroy, Evader Surveillance under Incomplete Information, *Proc IEEE International Conference on Robotics and Automation (ICRA 2010)*, pages 5511-5518, Anchorage Alaska, USA, 2010.
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15. Rafael Murrieta-Cid, Raúl Monroy, Seth Hutchinson, and Jean Paul Laumond, A Complexity Result for the Pursuit-Evasion Game of Maintaining Visibility of a Moving Evader, *Proc IEEE International Conference on Robotics and Automation (ICRA 2008)*, pages 2657-2664, Pasadena California, USA, 2008.
Link to the paper in IEEE Xplore, DOI: 10.1109/ROBOT.2008.4543613

14. Rafael Murrieta-Cid, Lourdes Muñoz, Moises Alencastre, Alejandro Sarmiento, Stephen Kloder, Seth Hutchinson, Florent Lamiraux and Jean Paul Laumond, Maintaining Visibility of a Moving Holonomic Target at a Fixed Distance with a Non-Holonomic Robot, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2005)*, pages 2028-2034, Edmonton, Canada, 2005.
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13. Teja Muppirala, Rafael Murrieta-Cid and Seth Hutchinson, Optimal Motion Strategies Based on Critical Events to Maintain Visibility of a Moving Target, *Proc IEEE International Conference on Robotics and Automation (ICRA 2005)*, pages 3837-3842, Barcelona, Spain, 2005.
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12. Alejandro Sarmiento, Rafael Murrieta-Cid and Seth Hutchinson, A Sample-based Convex Cover for Rapidly Finding an Object in a 3-D environment, *Proc IEEE International Conference on Robotics and Automation (ICRA 2005)*, pages 3497-3502, Barcelona, Spain, 2005.
Link to the paper in IEEE Xplore, DOI: 10.1109/ROBOT.2005.1570649

11. Alejandro Sarmiento, Rafael Murrieta-Cid and Seth Hutchinson, Planning Expected-time Optimal Paths for Searching Known Environments, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2004)*, pages 872-878, Sendai Japan, 2004.
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10. Sourabh Bhattacharya, Rafael Murrieta-Cid and Seth Hutchinson, Path Planning for a Differential Drive Robot: Minimal Length Paths - a Geometric Approach, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2004)*, pages 2793-2798, Sendai Japan, 2004.
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9. Rafael Murrieta-Cid, Alejandro Sarmiento, Sourabh Bhattacharya and Seth Hutchinson, Maintaining Visibility of a Moving Target at a Fixed Distance: The Case of Observer Bounded Speed, *Proc IEEE International Conference on Robotics and Automation (ICRA 2004)*, pages 479-484, New Orleans, USA, 2004.
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8. Alejandro Sarmiento, Rafael Murrieta-Cid and Seth Hutchinson, An Efficient Strategy for Rapidly Finding an Object in a Polygonal World, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2003)*, pages 1153-1158, Las Vegas, USA, 2003.
   Link to the paper in IEEE Xplore, DOI: 10.1109/IROS.2003.1248801

7. Benjamín Tovar, Steven M. LaValle and Rafael Murrieta-Cid, Locally-optimal Navigation in Multiply-connected Environments without Geometric Maps, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2003)*, pages 3491-3497, Las Vegas, USA, 2003.
   Link to the paper in IEEE Xplore, DOI: 10.1109/IROS.2003.1249696

6. Rafael Murrieta-Cid, Alejandro Sarmiento and Seth Hutchinson, On the Existence of a Strategy to Maintain a Moving Target within the Sensing Range of an Observer Reacting with Delay, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2003)*, pages 1184-1191, Las Vegas, USA, 2003.
   Link to the paper in IEEE Xplore, DOI: 10.1109/IROS.2003.1248806

5. Benjamín Tovar, Steven M. LaValle and Rafael Murrieta-Cid, Optimal Navigation and Object Finding without Geometric Maps or Localization, *Proc IEEE International Conference on Robotics and Automation (ICRA 2003)*, pages 464-470, Taipei, Taiwan, 2003.
   Link to the paper in IEEE Xplore, DOI: 10.1109/ROBOT.2003.1241638

4. Benjamín Tovar, Rafael Murrieta-Cid and Claudia Esteves, Robot Motion Planning for Map Building, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2002)*, pages 673-680, Lausanne Switzerland, 2002.
   Link to the paper in IEEE Xplore, DOI: 10.1109/IRDS.2002.1041469

3. Rafael Murrieta-Cid, Carlos Parra, Michel Devy, Benjamín Tovar and Claudia Esteves, Building Multi-Level Models: From Landscapes to Landmarks, *Proc IEEE International Conference on Robotics and Automation (ICRA 2002)*, pages 4346-4353, Washington, USA, 2002.
   Link to the paper in IEEE Xplore, DOI: 10.1109/ROBOT.2002.1014444

2. Rafael Murrieta-Cid, Héctor González and Benjamín Tovar, A Reactive Motion Planner to Maintain Visibility of Unpredictable Targets, *Proc IEEE International Conference on Robotics and Automation (ICRA 2002)*, pages 4242-4248, Washington, USA, 2002.
   Link to the paper in IEEE Xplore, DOI: 10.1109/ROBOT.2002.1014421

1. Rafael Murrieta-Cid, Maurice Briot and Nicolas Vandapel, Landmark Identification and Tracking in Natural Environment, *Proc IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 1998)*, pages 179-184, Victoria Canada, 1998.
   Link to the paper in IEEE Xplore, DOI: 10.1109/IROS.1998.724616

- **Professional Service:** Editor IEEE Transactions on Robotics. Associate Editor IEEE Transactions on Robotics (2021-2024). Reviewer: IEEE Transactions on Robotics, International Journal of Robotics Research, IEEE Robotics and Automation Letters, Journal Autonomous Robots, Journal Robotics and Autonomous Systems.
  Associate Editor IEEE-ICRA 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2021. Associate Editor IEEE/RSJ-IROS 2008, 2009, 2010, 2011, 2012. Associate Editor RSS 2021. Co-organizer and lecturer of the Second Summer School France-México on Images and Robotics (INRIA/LAFMI), summer 2001.

- **Collaborators:** H. Becerra, I. Becerra, S. Hutchinson, J.-C. Latombe, J.-P. Laumond, S. LaValle, R. Monroy, U. Ruiz, E. Sucar and J.I. Vasquez.

- **Honors and Awards:**

  - Member of "Sistema Nacional de Investigadores" (SNI) México: Rank 3, period 2021-2025.

  - Member of the Mexican Academy of Sciences.

  - Sabbatical project grant from National Council of Humanities, Science and Technology of México (CONAHCYT) for a sabbatical stay of a year (09 2024-08 2025) in the National Institute of Research in Computer Science and Control (INRIA) France.

  - Recipient of the Academic Leaders Program Award, Tecnológico de Monterrey, Campus of Guadalajara (2016).

  - Sabbatical project grant from National Council of Science and Technology of México (CONACYT) for a sabbatical stay of a year (2016) in University of Illinois at Urbana-Champaign.

  - The Romulo Garza Award (third place in Science and Technology) from the Tec de Monterrey (2011), for the paper "Planning Exploration Strategies for Simultaneous Localization and Mapping," by B. Tovar, L. Munoz-Gomez, R. Murrieta-Cid, M. Alencastre-Miranda, R. Monroy, and S. Hutchinson, Robotics and Autonomous Systems, Elsevier, Vol. 54, No. 4, April 2006, pp. 314-331. Link to the paper

  - Best paper award, 1st place, 4th Mexican International Conference on Artificial Intelligence (MICAI) 2005 (432 submitted papers from 43 countries, acceptance rate 28 %), "A Framework for Reactive Motion and Sensing Planning: A Critical Events-based Approach", Rafael Murrieta-Cid, Alejandro Sarmiento, Teja Muppirala, Seth Hutchinson, Raul Monroy, Moises Alencastre-Miranda, Lourdes Muñoz-Gomez and Ricardo Swain. Link to the paper

  - Best paper award, 1st place, IX Ibero-American Conference on Artificial Intelligence (IBERAMIA) 2004 (304 submitted papers from 21 countries, acceptance rate 31%), "A Multirobot Strategy for Rapidly Searching a Polygonal Environment", Alejandro Sarmiento, Rafael Murrieta-Cid and Seth Hutchinson. Link to the paper

  - PhD. Dissertation selected by the LAAS/CNRS for INPT outstanding PhD. dissertations competition 1998.

  - Ph.D student grant SFERE-CONACYT 1994-1998.