

Juan Irving Vasquez Gomez



Date of birth: November, 1984

Position: Associate professor at Instituto Politécnico Nacional (IPN), Mexico. Centro de Innovación y Desarrollo Tecnológico en Cómputo (CIDETEC)

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Research Interests:

Robotics, Computer Vision, Three-dimensional Modelling, Motion Planning.

• PERSONAL STATEMENT:

I am a scientific researcher passionate about understanding the motion planning algorithms that involve active sensing. My training as an engineer and scientist has allowed me to propose, analyze and implement state-of-the-art solutions for several theoretical and practical problems. My current research interests include deep learning-based computer vision, robot motion planning, autonomous 3D reconstruction, and autonomous surface inspection.

• EDUCATION:

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|------|---|
| 2014 | PhD. in Computer Sciences. <i>Institute for Astrophysics Optics and Electronics (INAOE)</i> 🔗. Thesis: View Planning for 3D Object Reconstruction with Mobile Robots 📄. Advisors: Enrique Sucar and Rafael Murrieta. |
| 2009 | M. Sc. in Computer Sciences. <i>Institute for Astrophysics Optics and Electronics (INAOE)</i> 🔗. Thesis: View Planning for Three-dimensional Object Reconstruction 📄. Advisors: Enrique Sucar and Efraim Lopez-Damian. |
| 2006 | B.S.E. in Computer Systems Engineering <i>Tehuacan Institute of Technology (ITT)</i> , Graduated by “Score of excellence”. |

• PUBLICATIONS:

– JCR Journals:

- * Flores-Aquino, Gabriel O. and Vasquez-Gomez, J. Irving and Gutierrez-Frias, O. Octavio, Custom Distribution for Sampling-Based Motion Planning, *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, (2022), 📄, I.F. 2.220

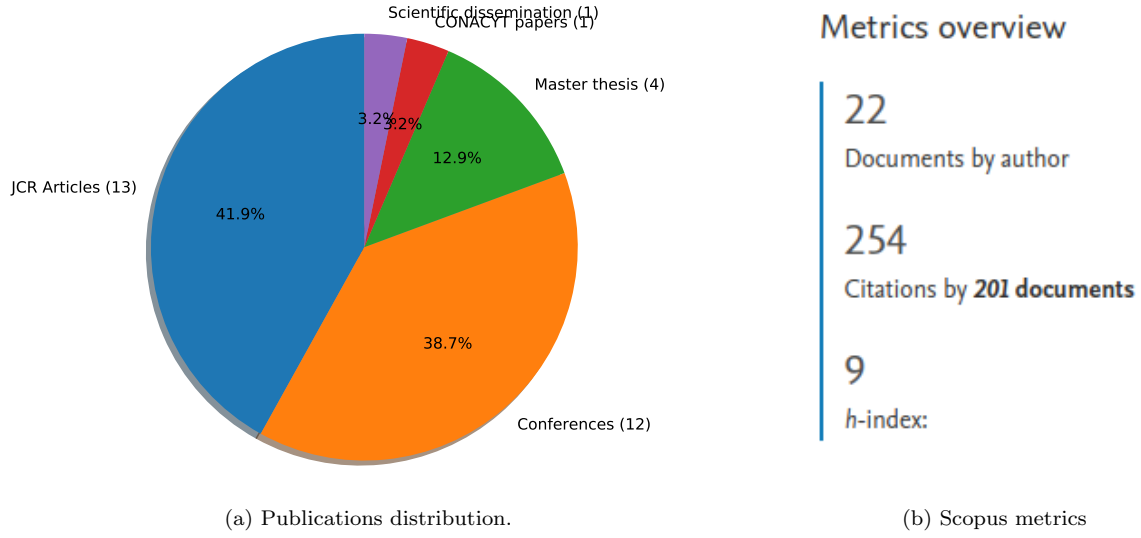










Figure 1: Scientific products.



- * Vazquez-Carmona, E. Viridiana and Vazquez-Gomez, J. Irving and Herrera Lozada, Juan Carlos and Antonio-Cruz, Mayra, Coverage Path Planning for Spraying Drones, *Accepted to Computers and Industrial Engineering*, (2022), I.F. 5.431
- * Rodríguez-Hernandez, Erick; Vasquez, Juan Irving; Duchanoy, Carlos; Taud, Hind, Un-supervised Driving Situation Detection in Latent Space for Autonomous Cars, *Applied Sciences*, (2022), , I.F. 2.679
- * Vazquez-Gomez, J Irving and Troncoso, David and Becerra, Israel and Sucar, Enrique and Murrieta-Cid, Rafael, Next-best-view regression using a 3D Convolutional Neural Network, *Machine Vision and Applications*, (2021), , I.F. 1.605
- * Vazquez-Gomez, Juan Irving and Marciano-Melchor, Magdalena and Valentin, Luis and Herrera-Lozada, Juan Carlos, Coverage Path Planning for 2D Convex Regions, *Journal of Intelligent and Robotic Systems*, (2020), , I.F. 2.020
- * Vazquez-Carmona, Viridiana and Vazquez-Gomez, Juan Irving and Herrera-Lozada, Juan Carlos, Environmental Monitoring using Embedded Systems on UAVs, *IEEE Latin America Transactions*, (2020), , I.F. 0.804
- * Mendoza, Miguel and Vazquez-Gomez, J Irving and Taud, Hind and Sucar, Luis Enrique and Reta, Carolina, Supervised Learning of the Next-Best-View for 3D Object Reconstruction, *Pattern Recognition Letters*, (2020), , I.F. 2.810
- * Yervilla-Herrera, Heikel and Vazquez-Gomez, J Irving and Murrieta-Cid, Rafael and Becerra, Israel and Sucar, L Enrique, Optimal motion planning and stopping test for 3-D object reconstruction, *Intelligent Service Robotics*, (2019), , I.F. 1.346
- * Lopez-Jimenez, Efren and Vazquez-Gomez, Juan Irving and Sanchez-Acevedo, Miguel Angel and Herrera-Lozada, Juan Carlos and Uriarte-Arcia, Abril Valeria, Columnar cactus recognition in aerial images using a deep learning approach, *Ecological Informatics*, (2019), , I.F. 2.310
- * Olguin-Carbajal, M and Herrera-Lozada, J.C. and Sandoval-Gutierrez, J. and Vazquez-Gomez J.I., and Serrano-Talamantes J.F. and Chavez-Estrada F.A. and Rivera-Zarate, I. and Hernandez-Bolanos, M., A Micro-DE Algorithm for Continuous Complex Functions, *IEEE Access*, (2019), , I.F. 4.098

- * Vasquez-Gomez, J Irving and Sucar, L Enrique and Murrieta-Cid, Rafael and Herrera-Lozada, Juan-Carlos, Tree-based search of the next best view/state for three-dimensional object reconstruction, *International Journal of Advanced Robotic Systems*, (2018), [DOI](#), I.F. 1.223
- * Vasquez-Gomez, J Irving and Sucar, L Enrique and Murrieta-Cid, Rafael, View/state planning for three-dimensional object reconstruction under uncertainty, *Autonomous Robots*, (2017), [DOI](#), I.F. 2.244
- * Vasquez-Gomez, J Irving and Sucar, L Enrique and Murrieta-Cid, Rafael and Lopez-Damian, Efraim, Volumetric next-best-view planning for 3d object reconstruction with positioning error, *International Journal of Advanced Robotic Systems*, (2014), [DOI](#), I.F. 0.526

– **Conferences:**





- * Vasquez-Gomez, J. Irving and Taud, Hind, Machine learning based priority read list for the detection of pneumonia in chest x-ray images, *I Congreso Internacional de Tecnología Aplicada a Ciencias de la Salud*, 2021
- * Gabriel O. Flores-Aquino; Jheison Duvier Díaz Ortega; Ricardo Yahir Almazan Arvizu; Raúl López Muñoz; O. Octavio Gutierrez-Frias; J. Irving Vasquez-Gomez, 2D Grid Map Generation for Deep-Learning-based Navigation Approaches, *2021 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE)*, 2021
- * Vasquez-Gomez, J. Irving, VPL: A view planning library for 3D object reconstruction, *International Conference on Mechatronics, Electronics and Automotive Engineering 2020 (ICMEAE)*, 2020
- * Rodríguez-Hernandez, Erick and Vasquez-Gomez, Juan Irving and Herrera-Lozada, Juan Carlos, Flying through Gates using a Behavioral Cloning Approach, *2019 International Conference on Unmanned Aircraft Systems (ICUAS)*, 2019
- * Vasquez-Gomez, Juan Irving and Herrera-Lozada, Juan-Carlos and Olguin-Carbajal, Mauricio, Coverage path planning for surveying disjoint areas, *2018 International Conference on Unmanned Aircraft Systems (ICUAS)*, 2018
- * Vasquez-Gomez, Juan Irving and Herrera-Lozada, Juan Carlos and Olguin-Carbajal, Mauricio, Spatial resolution optimization for terrain coverage with UAVs, *2017 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE)*, 2017
- * Vasquez-Gomez, Juan Irving and Melchor, Magdalena Marciano and Lozada, Juan Carlos Herrera, Optimal coverage path planning based on the rotating calipers algorithm, *2017 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE)*, 2017
- * Vasquez-Gomez, J Irving and Gomez-Castañeda, Cecilia and De Cote, Enrique Muñoz and Herrera-Lozada, Juan Carlos, Multirotor uav coverage planning under wind conditions, *2016 International Conference on Mechatronics, Electronics and Automotive Engineering (ICMEAE)*, 2016
- * Vasquez-Gomez, J Irving and Sucar, L Enrique and Murrieta-Cid, Rafael, View planning for 3d object reconstruction with a mobile manipulator robot, *2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2014
- * Vasquez-Gomez, J Irving and Sucar, L Enrique and Murrieta-Cid, Rafael, Hierarchical ray tracing for fast volumetric next-best-view planning, *2013 International Conference on Computer and Robot Vision (CRV)*, 2013
- * Vasquez, Juan Irving and Sucar, L Enrique, Next-best-view planning for 3d object reconstruction under positioning error, *Mexican International Conference on Artificial Intelligence (MICAI)*, 2011
- * Vasquez-Gomez, Juan Irving and Lopez-Damian, Efraín and Sucar, Luis Enrique, View planning for 3D object reconstruction, *2009 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2009

– **Preprints:**

- * Uriarte-Arcia, Abril; Vasquez, Juan; Taud, Hind; Garcia-Floriano, Andrés; Ventura-Molina, Elias, Coast Sargassum Level Estimation from Smartphone Pictures, Submitted to Ecological Processes, 2021, 
- * Juan Carlos Olguin-Rojas, Juan Irving Vasquez, Gilberto Castens, Classification of Apples using Convolutional Neural Networks, Submitted to RFM, 2022, 

• **STUDENTS:**

– Master students:

- * Rodriguez Hernandez, Erick, *Clonación de comportamiento para cruce de pasajes estrechos con VANT*, , 2019, Instituto Politécnico Nacional.
- * Vazquez-Carmona, Viridiana, *Sistema electronico para el monitoreo de gases de efecto invernadero utilizando internet de las cosas y vehiculos aereos no tripulados*, , 2019, Instituto Politécnico Nacional.
- * Jimenez, Efren Lopez, *Sistema embebido para la supervision inteligente de terrenos con vehiculos aereos no tripulados*, , 2018, Instituto Politecnico Nacional.
- * Mendoza Guadarrama, Miguel, *NBV-Net: Una red neuronal para calcular la siguiente mejor vista*, , 2018, Instituto Politécnico Nacional.

• **CERTIFICATIONS**

- 2018, Flying Car Nanodegree, UDACITY, San Francisco California, USA.
- 2018, Computer Vision Nanodegree, UDACITY, San Francisco California, USA.