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:**

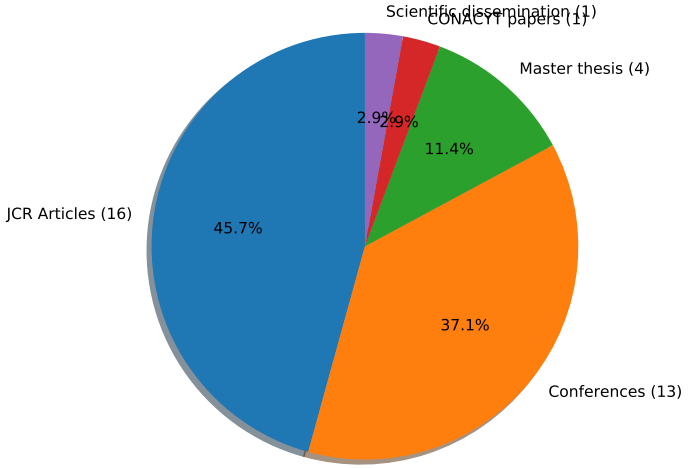
  2014 — **PhD. in Computer Sciencies.** *Institute for Astrophysics Optics and Electronics (INAOE)* . Thesis: View Planning for 3D Object Reconstruction with Mobile Robots . Advisors: Enrique Sucar and Rafael Murrieta.

  2009 — **M. Sc. in Computer Sciencies.** *Institute for Astrophysics Optics and Electronics (INAOE)* . Thesis: View Planning for Three-dimensional Object Reconstruction . Advisors: Enrique Sucar and Efrain Lopez-Damian.

  2006 — **B.S.E. in Computer Systems Engineering** *Tehuacan Institute of Technology (ITT)*, Graduated by "Score of excelence".

- **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



(a) Publications distribution.

(b) Scopus metrics

Figure 1: Scientific products.

* Vazquez-Carmona, E. Viridiana and Vasquez-Gomez, J. Irving and Herrera Lozada, Juan Carlos and Antonio-Cruz, Mayra, Coverage Path Planning for Spraying Drones, *Computers and Industrial Engineering,* (2022), , I.F. 5.431
* Vasquez, Juan Irving and Uriarte-Arcia, Abril Valeria and Taud, Hind and García-Floriano, Andrés and Ventura-Molina, Elías, Coastal Sargassum Level Estimation from Smartphone Pictures, *Applied Sciences,* (2022), , I.F. 2.838
* Rodríguez-Hernandez, Erick; Vasquez, Juan Irving; Duchanoy, Carlos; Taud, Hind, Unsupervised Driving Situation Detection in Latent Space for Autonomous Cars, *Applied Sciences,* (2022), , I.F. 2.679
* Juan Carlos Olguin-Rojas, Juan Irving Vasquez, Gilberto Castens, Classification of Apples using Convolutional Neural Networks, *Revista Fitotecnia Mexicana,* (2022), , I.F. 0.418
* Vasquez, Juan Irving and Merchán-Cruz, Emmanuel Alejandro, A Divide and Conquer Strategy for Sweeping Coverage Path Planning, *Energies,* (2022), , I.F. 3.252
* Vasquez-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
* Vasquez-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 Vasquez-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 Vasquez-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 Vasquez-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 Vasquez-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 Vasquez-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), , 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), , I.F. 2.244
* Vasquez-Gomez, J Irving and Sucar, L Enrique and Murrieta-Cid, Rafael and Lopez-Damian, Efrain, Volumetric next-best-view planning for 3d object reconstruction with positioning error, *International Journal of Advanced Robotic Systems,* (2014), , I.F. 0.526

– **Conferences**:

* Vasquez-Gomez, Juan Irving and Troncoso Romero, David E. and Antonio-Cruz, Mayra and Zamora, Erik, Spiral Trajectories for Building Inspection with Quadrotors, *2022 International Conference on Unmanned Aircraft Systems (ICUAS),* 2022
* 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,

- **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.