GIOVANNI E. MOLINA RAMOS

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Summary

Flight software developer at Intuitive Machines. I work on optical navigation algorithm research and development as well as FSW implementation, software-in-the-loop, hardware-in-the-loop testing and field testing. I also work with optical sensor analysis, testing and integration. Skilled in computer vision and digital image processing.

Computer Science PhD candidate with experience in Image Processing, Computer Vision, Machine Learning, Deep Learning and Natural Language Processing. Currently applying machine learning techniques to improve medical image processing and MRI image reconstruction.

EDUCATION

PhD in *Computer Science,* University of Houston (May 2023) GPA 3.65
B.S. in *Computer Science*, University of Puerto Rico at Bayamón (May 2015) GPA 3.67

PUBLICATIONS

Molina, G., Hansen, M., Getchius, J., Christensen, R., Christian, J. A., Stewart, S., & Crain, T. (2022). **VISUAL ODOMETRY FOR PRECISION LUNAR LANDING**. In 2020 AAS G&C Conference.

Getchius, J., Renshaw, D., Posada, D., Henderson, T., Ge, S., & Molina, G. (2022). **HAZARD DETECTION AND AVOIDANCE FOR THE NOVA-C LANDER**. In 2022 AAS G&C Conference.

Stuart S., Molina G., Crain T. (2020). **THIN VPU: OPEN SOURCE VISION PROCESSING FOR SPACE NAVIGATION.** In 2020 AAS G&C Conference.

Molina, G., Velazco-Garcia, J. D., Shah, D., Becker, A. T., Seimenis, I., Tsiamyrtzis, P., & Tsekos, N. V. (2019, October). **Automated Segmentation and 4D Reconstruction of the Heart Left Ventricle from CINE MRI.** In 2019 IEEE 19th International Conference on Bioinformatics and Bioengineering (BIBE) (pp. 1019-1023). IEEE.

Molina, G., Rey-Villamizar, N., Solorio, T., AlGhamdi, F., Ghoneim, M., Hawwari, A., & Diab, M. (2016). **Overview for the Second Shared Task on Language Identification in Code-Switched Data.** EMNLP 2016, 40.

AlGhamdi, F., Molina, G., Diab, M., Solorio, T., Hawwari, A., Soto, V., & Hirschberg, J. (2016). **Part of Speech Tagging for Code Switched Data.** EMNLP 2016, 98.

EXPERIENCE

Software Developer. Intuitive Machines (2021- Present)
- Optical Navigation software research and development for the NOVA-C spacecraft.
- Analysis of optical navigation performance, test and verification of algorithms and software.
- Hardware in the loop field testing of optical navigation flight software.
- Optical sensor procurement, evaluation and testing for precise optical navigation use in spacecrafts.

Software Engineering Intern. Intuitive Machines (2019-2021).
- Worked in the aviation team developing and improving optical image processing algorithms.
- Working in the lunar lander team designing, analyzing and developing optical image processing algorithms.

Research Assistant. University of Houston (2015-present).
- Working with Dr. Nikolaos Tsekos as part of the Medical Robotics and Imaging Lab.
- Applying machine learning techniques to improve medical image processing tasks such as Medical Image Segmentation, Medical Image Synthesis and MRI Image Reconstruction.
- Integrating Holographics and interactive machine learning to aid surgeons before, during and after surgeries.
- Worked with Dr. Thamar Solorio in NLP research as part of the RiTUAL lab.
- Designed machine learning models to detect different languages in code-switched text and models that apply Part of Speech tags to the text. Developed a Deep Learning model that combined both tasks into one end-to-end model.
- Studied and analyzed child language transcripts to design NLP tools that automatically find syntactic patterns that indicate language impairment in bilingual children.
- Served as Publications and Shared Task chair for the Second Workshop on Computational Approaches to Code Switching (EMNLP 2016).
- Supervised a team of undergraduate students and used crowdsourcing and manual tools to annotate a large dataset of Twitter data used in the Language Identification in Code-Switched (CS) Data Shared Task (EMNLP 2016).

Teaching Assistant/Instructor. University of Houston (2017-2020).
- TA for courses: Software Engineering, Parallel Computations, Intro to Programming.
- TA and Instructor for Numerical Methods, Medical Imaging.

IT Intern: Cardinal Health, Inc. (2013-2015).
- Worked as an intern in the IT Department.
- Developed software and services that allow more efficient business operations and provide a better end-user experience.
- Developed communication and team-work skills.
- Learned efficient project planning, code review and testing along with the ability to meet required deadlines for software production.

Summer Research Internship: University of Houston-Downtown (Summer 2014).
- Worked with Arduino, Android, Kinect, C# and data mining tools to develop a human emotion response system for drivers.
- Practiced teamwork, literature research and modular integration.

SKILLS

Knowledgeable in: Computer Vision, Digital Image Processing, Natural Language Processing, Machine Learning, Deep Learning.
Programming Languages: Python, C/C++, JAVA, CUDA, ASP.NET, VB, C#, SQL.
Communication: Fully Bilingual: written and spoken English and Spanish languages.