Jhacson **Meza**

Cartagena, Colombia

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Education

M.Sc. in Engineering   *Cartagena, Colombia*
Universidad Tecnológica de Bolívar   *2019 - Present*
- Current GPA: 4.87/5.0

B.E. in Mechatronic Engineering   *Cartagena, Colombia*
Universidad Tecnológica de Bolívar   *2014 - 2018*
- GPA: 4.61/5.0
- Thesis: Generation of Digital Elevation Models with Unmanned Aerial Vehicles employing 3D Photogrammetry Techniques on Open Source Software, 5.0/5.0

Research Interests

Computer Vision, 3D Reconstruction, Deep Learning, Image Processing, Optical Metrology, Medical Imaging, 3D Ultrasound, Digital Fringe Projection, Machine Learning.

Honors & Awards

2021	**Runner-up Best Paper Award**, LXCV Workshop at CVPR 2021	
2020	**"Joven Talento" Scholarship**, Ministry of Science and Ministry of Health of Colombia	*Colombia*
2019	**Best Paper Award on Machine Learning and Pattern Recognition**, XXII Symposium on Image, Signal Processing and Artificial Vision (STSIVA)	*Bucaramanga, Colombia*
2019	**Masters Scholarship**, Universidad Tecnológica de Bolívar	*Cartagena, Colombia*
2019	**Laureate Undergraduate Thesis**, Universidad Tecnológica de Bolívar	*Cartagena, Colombia*
2016	**Matrícula de Honor (Best GPA)**, Universidad Tecnológica de Bolívar	*Cartagena, Colombia*
2015	**Matrícula de Honor (Best GPA)**, Universidad Tecnológica de Bolívar	*Cartagena, Colombia*
2014-2018	**Outstanding Student**, Universidad Tecnológica de Bolívar	*Cartagena, Colombia*
2014	**Premio Liderazgo Caribe (undergraduate scholarship)**, Universidad Tecnológica de Bolívar	*Cartagena, Colombia*

Experience

Adjunct Professor   *Cartagena, Colombia*
Universidad Tecnológica de Bolívar   *Feb 2020 - Aug 2020*
Faculty of Basic Sciences, mechanical physics laboratory

Research Assistant   *Cartagena, Colombia*
Group of Applied Physics and Image and Signal Processing, Universidad Tecnológica de Bolívar   *Aug 2018 - Present*
- MarkerPose: Robust, real-time pose estimation system based on a planar marker and Deep Learning.
- Image segmentation of corneal endothelium and corneal guttata with CNNs, using GANs for data augmentation.
- Development of a 3D multimodal medical imaging technique by combining 3D freehand ultrasound and structured light.
- Development of a high-speed digital fringe projection system for the automatic reading of the skin prick test.
- Analysis of different triangulation methods and their relationship with phase-depth sensitivity in structured light systems.
- Development of different phase unwrapping strategies robust to noise and phase dislocations.

Research Assistant   *Cartagena, Colombia*
Optics and Image Processing Laboratory, Universidad Tecnológica de Bolívar   *Sep 2018 - Mar 2019*
- Structure-from-Motion (SfM) pipeline reconstruction based on the OpenSfM and OpenDroneMap libraries.
- DTM pipeline generation from a SfM point cloud for terrain analysis.
- Surface-runoff analysis of a neighborhood in the municipality of Turbaco, Colombia with flood problems due to rainfall.

Undergraduate Teaching Assistant   *Cartagena, Colombia*
Universidad Tecnológica de Bolívar   *Feb 2018 - Jun 2018*
Faculty of Engineering, Analogue Electronics

Undergraduate Teaching Assistant   *Cartagena, Colombia*
Universidad Tecnológica de Bolívar   *Feb 2015 - Dec 2016*
Faculty of Basic Sciences: Differential Calculus, Integral Calculus, Vector Calculus, Differential and Difference Equations

Participation in R+D Projects

Development of a computational strategy for the automatic reading of the skin test used in the diagnosis of allergies using the device SPT 3D Scan
Colombia
Feb 2020 – Feb 2021
Funded by Ministry of Health and Ministry of Science of Colombia

Multimodal 3D medical imaging system using fringe projection and ultrasound
Colombia
Sep 2018 – Jun 2019
Funded by Universidad Tecnológica de Bolívar

3D photogrammetry using unmanned aerial vehicles for drain analysis
Colombia
Jun 2017 – Mar 2018
Funded by Universidad Tecnológica de Bolívar

Publications

JOURNAL ARTICLES

- Jhacson Meza, Sonia H. Contreras-Ortiz, Lenny A. Romero, Andres G. Marrugo. Three-dimensional multimodal medical imaging system based on freehand ultrasound and structured light. *Optical Engineering*, 60(5), 054106, 2021.

- Jesus Pineda, Jorge Bacca, Jhacson Meza, Lenny A. Romero, Henry Arguello, and Andres G. Marrugo. SPUD: simultaneous phase unwrapping and denoising algorithm for phase imaging. *Applied Optics*, 59(13), D81-D88, 2020.

PEER REVIEWED CONFERENCE PROCEEDINGS

- Jhacson Meza, Lenny A. Romero, Andres G. Marrugo. MarkerPose: Robust Real-time Planar Target Tracking for Accurate Stereo Pose Estimation. *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2021. **[Oral Presentation, Runner-up Best Paper Award]**

- Jhacson Meza, Raul Vargas, Lenny A. Romero, Song Zhang, Andres G. Marrugo. What is the best triangulation approach for a structured light system? *Dimensional Optical Metrology and Inspection for Practical Applications IX*, SPIE, 2020.

- Jhacson Meza, Pedro Simarra, Sara Contreras-Ojeda, Lenny A. Romero, Sonia H. Contreras-Ortiz, Fernando Arámbula Cosío, Andrés G. Marrugo. A low-cost multi-modal medical imaging system with fringe projection profilometry and 3D freehand ultrasound. *15th International Symposium on Medical Information Processing and Analysis*, SPIE, 2020.

- Jhacson Meza, Andres G. Marrugo, Gabriel Ospina, Milton Guerrero and Lenny A. Romero. A Structure-from-Motion Pipeline for Generating Digital Elevation Models for Surface-Runoff Analysis. *Journal of Physics: Conference Series*, Vol. 1247, No. 1, IOP Publishing, 2019.

- Jesus Pineda, Jhacson Meza, Erik M. Barrios, Lenny A. Romero and Andres G. Marrugo. Noise-Robust Processing of Phase Dislocations using Combined Unwrapping and Sparse Inpainting with Dictionary Learning. *XXII Symposium on Image, Signal Processing and Artificial Vision (STSIVA)*, IEEE, 2019. **[Best Paper Award]**.

- Jhacson Meza, Andrés G. Marrugo, Enrique Sierra, Milton Guerrero, Jaime Meneses and Lenny A. Romero. A Structure-from-Motion Pipeline for Topographic Reconstructions using Unmanned Aerial Vehicles and Open Source Software. *Colombian Conference on Computing*, Springer, Cham, 2018.

Open Source Projects

- MarkerPose: PyTorch and LibTorch implementation of the paper "MarkerPose: Robust Real-time Planar Target Tracking for Accurate Stereo Pose Estimation."

- SL+3DUS: implementation of the paper "Three-dimensional multimodal medical imaging system based on freehand ultrasound and structured light."

- 3D freehand ultrasound calibration: Python implementation for calibration of a 3D freehand ultrasound system using a stereo vision system and a planar marker.

Academic Service

Peer reviewer for Journal of Applied Remote Sensing (2020), Engineering Science and Technology, an International Journal (2020), Optical Engineering (2021).

Skills

Programming	C/C++, Python, CUDA C++ (beginner), MATLAB.
Frameworks	OpenCV, PyTorch, LibTorch, TensorFlow/Keras.
Tools	Git, CMake, LaTeX.