

# Giulio Marin, Ph.D.

## *Computer Vision Algorithms Engineer*

### Personal

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Nationality Italian, USA H1-B visa (green card in progress)  
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### Work Experience

Nov 2019 – **Computer Vision Algorithms Engineer**

Present *Apple, Inc.*, Cupertino, CA  
Working on 3D reconstruction.

Dec 2017 – **Senior Computer Vision Engineer**

Jun 2019 *Aquifi, Inc.*, Palo Alto, CA

Leading a team that focuses on delivering accurate data from the depth camera. Developing algorithms for dimensioning, counting, objects identification and inspection using multiple cameras. Also working on classification, segmentation and anomaly detection combining 3D geometry and image based deep learning techniques like CNN and GAN. Deployed systems for machine vision ranging from portable devices to complex systems with multiple cameras.

Oct 2014 – **Computer Vision R&D Engineer**

Nov 2017 *Aquifi, Inc.*, Palo Alto, CA

Member of the R&D group of 4 people that designed low cost and low power active stereo cameras that later became the core product of the company and led to Series C financing. Developed core algorithms and applications with engineering group using 3D information from color and depth cameras. Applications include accurate depth estimation from stereo cameras, 3D reconstruction, meshing, texture mapping and AR/VR. Optimized algorithms to run efficiently on embedded systems with emphasis on speed and accuracy. Demoed products and prototypes to potential customers.

Sep 2013 – **Consultant**

Sep 2014 *Aquifi, Inc.*, Palo Alto, CA

Designed and developed computer vision algorithms and demos for touchless human/computer interaction with applications in remote interaction and privacy monitoring. Optimized code for low CPU utilization and low latency. Assisted in design, development and testing of application API and SDK using industry best practices. Implemented state of the art computer vision and machine learning algorithms.

2013 **Intern (R&D group)**

Jul-Sep *Imimtek, Inc. (then Aquifi Inc.)*, Sunnyvale, CA

Worked in a team with other computer vision PHDs to define the company's future products. Produced design that was then implemented in engineering. Developed algorithms and demos for hand and face tracking with low cost vision sensors.

### Education

2014–2017 **Ph.D. in Information Engineering**, University of Padova, Italy.

Thesis: *3D data fusion from multiple sensors and its applications.*

Advisor: Prof. Pietro Zanuttigh

2011–2013 **M.Sc. in Telecommunication Engineering**, University of Padova, Italy.

Thesis: *Confidence Estimation of ToF and Stereo Data for 3D Data Fusion.*

Advisor: Prof. Pietro Zanuttigh. Grade: 110/110 with highest honors.

2008–2011 **B.Sc. in Information Engineering**, University of Padova, Italy.

Thesis: *Linear Blend techniques for hand modeling from laser scanner data.*

Advisor: Prof. Pietro Zanuttigh. Grade: 110/110.

## Technical skills

Advanced C++, Python, Linux, OpenCV, TensorFlow, Matlab, Git, XCode, Microsoft Visual Studio  
Intermediate C, SIMD, Java, HTML/CSS, JS, Autodesk AutoCAD, Fusion 360  
Basic Objective-C, OpenGL

## Interests

Academic I'm a reviewer and TPC member for research publications ICIP, ICME and IEEE Signal Processing Letters. In the past I've tutored undergraduate students in math and physics.  
Projects I enjoy developing electro-mechanical devices using 3D printer and raspberry pi. In the past I built a solar concentrator and a rotating support for a 3D laser scanner.  
Sports I played competitive soccer in a youth league for 12 years. Now I regularly run, bike, hike and ski.

## Publications

**Number of citations: 610**

- patents
  - G. Marin, A. Rafii, C. Dal Mutto, "System and method for three-dimensional scanning and for capturing a bidirectional reflectance distribution function", Aquifi, Inc., US10055882B2, 2018.
  - F. Peruch, G. Murali, G. Marin, A. Rafii, K. Tieu, "System and method for assisted 3D scanning", Aquifi, Inc., US9912862B2, 2017.
  - A. Hazeghi, C. Dal Mutto, G. Marin, F. Peruch, M. Stoppa, A. Rafii, "Systems and methods for compact space-time stereo three-dimensional depth sensing", Aquifi, Inc., US9826216B1, 2016.
  - A. Hazeghi, G. Marin, F. Peruch, C. Dal Mutto, A. Rafii, "Systems and methods for reducing z-thickness and zero-order effects in depth cameras", Aquifi, Inc., US9503708B2, 2016.
  - C. Dal Mutto, G. Marin, A. Rafii, T. Zuccarino, "Systems and Methods for Implementing Head Tracking Based Graphical User Interfaces (GUI) that Incorporate Gesture Reactive Interface Objects", Aquifi, Inc., US9507417B2 A1, 2015.
- books
  - P. Zanuttigh, G. Marin, C. Dal Mutto, F. Dominio, L. Minto, G. M. Cortelazzo, "Time-of-Flight and Structured Light Depth Cameras: Technology and Applications", 1st ed., Springer, 2016.
- book chapters
  - F. Dominio, G. Marin, M. Piazza, P. Zanuttigh, "Features descriptors for depth-based hand gesture recognition", Computer Vision and Machine Learning with RGB-D Sensors, Springer, 2014.
- journals
  - G. Agresti, L. Minto, G. Marin, P. Zanuttigh, "Stereo and ToF data fusion by learning from synthetic data", Information Fusion, Elsevier, 2018.
  - G. Marin, F. Dominio, P. Zanuttigh, "Hand Gesture Recognition with Jointly Calibrated Leap Motion and Depth Sensor", Multimedia Tools and Applications, Springer, 2015.
- conferences
  - G. Agresti, L. Minto, G. Marin, P. Zanuttigh, "Deep Learning for Confidence Information in Stereo and ToF Data Fusion", ICCV Workshop: 3D Reconstruction meets Semantics, Venice, Italy, 2017.
  - G. Marin, P. Zanuttigh, S. Mattocchia, "Reliable Fusion of ToF and Stereo Depth Driven by Confidence Measures", European Conference on Computer Vision, Amsterdam, The Netherlands, 2016.
  - L. Minto, G. Marin, P. Zanuttigh, "3D Hand Shape Analysis for Palm and Fingers Recognition", Automatic Face and Gesture, Ljubljana, Slovenia, 2015.
  - G. Pozzato, S. Michieletto, E. Menegatti, F. Dominio, G. Marin, L. Minto, S. Milani, P. Zanuttigh, "Human-Robot Interaction with Depth-Based Gesture Recognition", Real Time Gesture Recognition for Human-Robot Interaction Workshop, Padova, Italy, 2014.
  - G. Marin, F. Dominio, P. Zanuttigh, "Hand gesture recognition with Leap Motion and Kinect devices", IEEE International Conference on Image Processing, Paris, France, 2014.
  - F. Dominio, M. Donadeo, G. Marin, P. Zanuttigh, G.M. Cortelazzo, "Hand gesture recognition with depth data", ACM Multimedia Artemis Workshop, Barcelona, Spain, 2013.
  - G. Marin, M. Fraccaro, M. Donadeo, F. Dominio, P. Zanuttigh, "Palm area detection for reliable hand gesture recognition", IEEE International Workshop on Multimedia Signal Processing (MMSp), Pula, Italy, 2013.
- other
  - G. Marin, G. Agresti, L. Minto, P. Zanuttigh, "A multi-camera dataset for depth estimation in an indoor scenario", Data in Brief, Elsevier, 2019.
- theses
  - G. Marin, Advisor Prof. P. Zanuttigh, "3D data fusion from multiple sensors and its applications", PhD School of Information Engineering, University of Padova, Italy, 2017.

- G. Marin, Advisor Prof. P. Zanuttigh, "Confidence estimation of ToF and stereo data for 3D data fusion", Laurea magistrale in Telecommunication Engineering, University of Padova, Italy, 2013.
- G. Marin, Advisor Prof. P. Zanuttigh, "Modelli deformabili della mano a partire da dati acquisiti tramite laser scanner", Laurea triennale in Information Engineering, University of Padova, Italy, 2011.

*Sunnyvale, November 27, 2019*