

# Gines Hidalgo

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## EDUCATION

- M.S. Robotics, The Robotics Institute, Carnegie Mellon University (CMU)** Aug 2016 - Present  
Pittsburgh, USA  
• Current GPA: 4.17 / 4.33
- B.S. in Telecom. System Engr.<sup>1</sup>, Universidad Politécnica de Cartagena (UPCT)** Sep 2010 - Jul 2014  
Cartagena, Spain  
• Rank 1, GPA: 9.09 / 10.00
- Erasmus exchange program fellowship, FH St. Pölten University of Applied Sciences** Feb 2014 - Jun 2014  
St. Pölten, Austria  
• GPA: 1.3 / 5.0 (where 1 is the best possible, 5 the worst)

## RESEARCH EXPERIENCE

- Research Associate - Perceptual Computing Lab, The Robotics Institute, CMU** Dec 2016 - Present  
Pittsburgh, USA  
Advisor: Dr. Yaser Sheikh  
**OpenPose<sup>2</sup>**
  - **First real-time system** to jointly detect 130 human **whole-body keypoints** (body, hand, and face).
  - Lead author and main developer; increased speed by 30% and accuracy by 3%.
  - Integrated body, hands, and face keypoint algorithms into single framework; developed foot and face keypoint detectors.**Panoptic Studio**
  - Massive Multiview System Dataset formed by 480 VGA, 31 full HD, and 10 RGB-D cameras.
  - Analyzed dataset to isolate and extract most useful images to boost pose estimation accuracy pre-trained on other datasets.
  - Collected video sequences for social studies.**Ford collaboration**
  - Real-time whole-body keypoint detection applied to driver monitoring and 3-D whole-body keypoint reconstruction.
  - Developed a robust 3-D reconstruction system with whole-body keypoint detection.

**Research Associate - Human Sensing Laboratory, The Robotics Institute, CMU** Sep 2014 - Dec 2016  
Pittsburgh, USA  
Advisor: Dr. Fernando De La Torre  
**IntraFace<sup>2</sup>**
  - Facial tracking library and emotion detector.
  - Developed and maintained current C++ GUI and maximized search efficiency for face detector algorithm.**Non-overlapping Camera Calibration, Driver Gaze Rectification, and Projection into the Road Scene**
  - Estimated position and orientation of 2 cameras with non-overlapping field-of-view.
  - Rectified driver's gaze tracking and projected into the road camera image in real time.**General Motors collaboration**
  - Eye gaze and head pose tracking for eyes-off-the-road monitoring in vehicles.
  - Implemented algorithm on the embedded system Nvidia Jetson TK1 and collected data.

**Student Intern - Electronics, Computer Technology, and Projects Department, UPCT** Oct 2012 - Jun 2013  
Cartagena, Spain  
Advisor: Professor Javier Toledo  
**Stereoscopic processing**
  - Developed a stereoscopic image rectification algorithm to calibrate image height and rotation.

## CONFERENCES

- Demos**  
*OpenPose: A Real-Time Multi-Person Keypoint Detection Library* Jul 2017  
**Gines Hidalgo**, Zhe Cao, Tomas Simon, Shih-En Wei, Hanbyul Joo, Yaser Sheikh  
CVPR 2017

## HONORS & AWARDS

- Telecommunication Systems Engineering Extraordinary Award, UPCT** Sep 2015

## QUALIFICATION

- Programming Languages**
  - **Proficient:** C++, MATLAB, Python
  - **Familiar:** CUDA, C#, Java, Android, SQL, HTML5, CSS, Javascript, VHDL, Assembly, QML**Tools**
  - **Proficient:** Caffe, OpenCV, Qt Project, Eigen, MSVC, GCC/G++, GitHub, NSIS (Install System),  $\LaTeX$
  - **Familiar:** Tensorflow, Torch, cuDNN, Vulkan/OpenGL Next, Boost, LibCurl, Crypto++, Sockets, Unity**Web:** Amazon Mech. Turk, Django, Bootstrap, Amazon Web Services (AWS), Amazon Elastic Computer Cloud (EC2)  
**Operating Systems:** Windows, Unix/Linux, Embedded Linux, Android

## TEACHING ASSISTANT

- MS-RT program (Master of Science - Robotics Technology), CMU** Fall 2015  
16-611 MS-RT Fundamentals of Robotics II. Advisor: Dr. Mel Siegel  
Pittsburgh, USA

<sup>1</sup>B.S. in Telecommunication System Engineering is similar to Electrical and Computer Engineering in the US

<sup>2</sup>See media coverage on <http://www.gineshidalgo.com/>, section *Media* (TechCrunch, Fortune, The Washington Post, DailyMail, ...)

## OTHERS

### Volunteer Experiences

- **Letters to a Pre-Scientist:** Inspiring school students to pursue STEM careers, USA Oct 2017 - Present
- **Science Fair Judge:** Covestro Pittsburgh Regional Science and Engineering Fair, Pittsburgh, USA Mar 2017

### Extra Academic Activity

- **M.S. Computer Vision (MSCV) Admissions Committee Member,** CMU Dec 2017 - Jan 2018
- **Web designer and administrator** ([www.tractolumbreras.com](http://www.tractolumbreras.com)) Jul 2008 - Present

**Languages:** Spanish (native), English (fluent), German (basic), French (basic)

## COURSEWORK

### CMU Courses

- 16-720 **Computer Vision**, Srinivasa Narasimhan & Yaser Sheikh.
- 16-824 **Visual Learning & Recognition**, Abhinav Gupta.
- 10-701 **Machine Learning**, Tom Mitchell.
- 10-725 **Convex Optimization**, Ryan Tibshirani.
- 16-811 **Math Fundamentals for Robotics**, Michael Erdmann.

## EXTENDED RESEARCH INFORMATION

### Other Involved Projects at Human Sensing Lab, CMU

#### Age Estimation Software

- Implemented an age estimation algorithm based on facial keypoints, SIFT features, and SVM classifier.

#### Levenberg-Marquardt Algorithm (LMA)

- Efficiently implemented LMA to solve non-linear least squares problems in embedded devices.

#### Server Designing, Development, and Maintenance ([www.humansensing.us](http://www.humansensing.us)):

- Designed, developed, and maintained a server infrastructure for software distribution.

#### GUI Development and Maintenance

- Implemented several multi-thread safe C++ GUIs for the lab's technologies.
- E.g. IntraFace GUI<sup>2</sup> & FeelingSpector (located in Newell-Simon Hall, CMU, and in the Pittsburgh International Airport).