

# Elizabeth Vargas Vargas

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CONTACT INFORMATION	Earl Mountbatten Building, G.06 Heriot-Watt University, Edinburgh United Kingdom, EH14 4AS <b>Phone:</b> (+44) · 7427 · 01 · 99 · 90 <b>Email:</b> elizabeth.vargas@hw.ac.uk	<b>Website:</b> <a href="https://evargasv.github.io/">https://evargasv.github.io/</a> <b>LinkedIn:</b> <a href="http://www.linkedin.com/in/evargasv">www.linkedin.com/in/evargasv</a>
PROFESSIONAL EXPERIENCE	<b>ORCA Hub</b> <i>Research Associate</i> <ul style="list-style-type: none"><li>• Computer Vision applied to Offshore Robotics for Certification of Assets (ORCA).</li><li>• Simultaneous Localisation And Mapping (SLAM) for underwater environments.</li><li>• Combination of Visual Odometry (VO) and Sensor Fusion methodologies (ROS).</li></ul> <b>Toshiba Medical Visualization Systems Ltd</b> <i>Research Intern with Corné Hoogendoorn</i> <ul style="list-style-type: none"><li>• Alzheimer Disease (AD) characterisation using Magnetic Resonance Imaging (MRI).</li><li>• Performed feature selection, classification and regression (Python, Scikit-learn).</li><li>• Texture analysis in hippocampus tissue to diagnose AD.</li></ul> <b>IVU Traffic Technologies AG</b> <i>Systems Analyst</i> <ul style="list-style-type: none"><li>• Analysis of software and hardware systems for public transportation sector and support to project in South America.</li><li>• Execution of tests, installation and configuration of hardware and software.</li><li>• Analysis of bugs and debugging coordination with the development team.</li></ul> <b>Siemens AG, Healthcare Sector</b> <i>Innovation Think Tank Participant</i> <ul style="list-style-type: none"><li>• Selected in a group of 20, among 256 students around the world to participate in interdisciplinary projects proposed and supervised by Siemens Healthcare experts.</li><li>• Investigation of the effects of technological advances on current healthcare systems.</li><li>• Lead a project that concluded in a new design for ultrasound catheters markers.</li></ul> <b>Philips GmbH, Research Laboratories</b> <i>Research Intern with Martin Weibrecht</i> <ul style="list-style-type: none"><li>• Magnetic Resonance Imaging (MRI) applied to characterisation of liver diseases.</li><li>• Features extraction from Diffusion Weighted MRI relevant for disease diagnosis.</li><li>• Implementation of a gray level based iterative segmentation algorithm employing threshold derived from histogram analysis (MATLAB).</li></ul>	Jan. 2019 - Present Edinburgh, United Kingdom Jun. 2015 - Sep. 2015 Edinburgh, United Kingdom Oct. 2012 - Aug. 2013 Cali, Colombia Feb. 2012 - Apr. 2012 Erlangen, Germany Mar. 2011 - Jul. 2011 Aachen, Germany
EDUCATION	<b>Ph.D. Signal Processing</b> <i>Heriot-Watt University, United Kingdom</i> <ul style="list-style-type: none"><li>• Acoustic source localisation in environments in which a constraint is present.</li><li>• Source localisation via direct optimisation reducing computation six fold (SciPy).</li><li>• Signal sampling implementation in the spectrogram for compressed transmissions.</li><li>• Improved training of neural networks for acoustic source localisation (TensorFlow).</li><li>• Thesis: "Acoustic Source Localisation in Constrained Environments".</li></ul>	Oct. 2015 - Sep. 2019

- Supervised by Keith Brown (*Heriot-Watt University*) and Kartic Subr (*University of Edinburgh*).
- Examiners: Abderrahim Halimi (*Heriot-Watt University*) and Keith Holland (*University of Southampton*).

**M.Sc. Computer Vision and Robotics with Distinction** Sep. 2013 - Jun. 2015  
*Heriot-Watt University, United Kingdom* GPA: 76.6/100

- Joint Erasmus Mundus Master Program with *University of Burgundy* (France), *University of Girona* (Spain) and *Heriot-Watt University* (United Kingdom).
- Basis of signal and image processing, medical image analysis (MATLAB).
- Image segmentation, multi-view geometry, object recognition and tracking (OpenCV).
- Robot autonomy and intelligence, including SLAM and motion planning (ROS).
- Thesis: “Texture Enhanced Tissue Analysis”.
- Supervised by Dr. Keith Goatman from Toshiba Medical Visualization Systems.

**B.Sc. Computer Science** Aug. 2006 - Aug. 2012  
*Universidad del Valle, Colombia* GPA: 4.67/5.0

- Courses in algorithms, data structures, compilers and software engineering.
- Projects including image processing (C/C++), search algorithms, optimisation, evolutionary algorithms, software development (Java) and databases (MySQL).
- Thesis: “Pruning Estimated Corresponding Points by Delaunay Triangulation”.
- Supervised by Dr. Maria Trujillo.

**B.Sc. Academic Exchange** Oct. 2010 - Feb. 2011  
*Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*

- Courses in pattern recognition, text mining and diagnostic medical image processing (MATLAB).

#### SELECTED PUBLICATIONS

- **E. Vargas**, J. R. Hopgood, K. Brown, K. Subr, “A Compressed Encoding Scheme for Approximate TDOA Estimation”, accepted to *European Signal Processing Conference*, (**EUSIPCO**), Rome, Italy, September 2018. (**Oral Presentation**)
- **E. Vargas**, K. Brown, K. Subr, “Impact of Microphone Array Configurations on Robust Indirect 3D Acoustic Source Localization”, in *International Conference on Acoustics, Speech and Signal Processing* (**ICASSP**), Calgary, Canada, April 2018. (**Oral Presentation**)
- C. Bustos, **E. Vargas**, M. Trujillo, “Classifying Estimated Stereo Correspondences based on Delaunay Triangulation”, in *IberoAmerican Congress on Pattern Recognition*, (**CIARP**), Lima, Peru, November 2016.
- **E. Vargas**, M. Trujillo, “A Corresponding Points Classification Approach by Delaunay Triangulation”, in *Latin American Conference on Networked and Electronic Media*, (**LACNEM**), Santiago, Chile, October 2012.

#### DISTINCTIONS

**James Watt Scholarship**, *Heriot-Watt University* Oct. 2015  
 Granted to 5 applicants for a Ph.D. position at the School of Engineering and Physical Sciences (EPS), awarding tuition fees and annual stipend to support studies for 3 years.

**Erasmus Mundus Scholarship**, *European Commission* Sep. 2013  
 Granted to 4 European students for academic and professional achievement to study a Master in Computer Vision and Robotics (ViBot) during the academic year 2013-2015.

**Young Innovative Student Award**, *Siemens Healthcare* Apr. 2012

In recognition of the tremendous effort, exceptional performance, and supportive leadership within the *Innovation Think Tank Camp*.

**Young Engineers Scholarship, DAAD and Colciencias** Jul. 2010  
Scholarship granted to 5 engineering students from Universidad del Valle, on the basis of academic achievement and proficiency in English and German, to go abroad for a year.

**TRAINING** **International Summer School on Deep Learning** Jul. 2018  
Research training event aiming at updating participants about the most recent advances in the critical and fast developing area of deep learning.

**Edinburgh Local GRADschool** Jun. 2018  
Oriented to develop communication (e.g. creativity and presentations), networking, time management, and team work (e.g. case studies and problem solving) skills.

**International Computer Vision Summer School (ICVSS)** Jul. 2016  
Provided an objective, clear, and in-depth summary of the state-of-the-art research in the areas of Computer Vision, Machine Learning and Artificial Intelligence.

**Associate Fellow** Apr. 2016  
In recognition of attainment according to the *UK Professional Standards Framework* for teaching and learning support in higher education.

**TECHNICAL SKILLS** **Operative Systems:** Windows, Linux (ubuntu)  
**Programming Languages:** Python, C/C++, Java  
**Libraries:** Visualization Toolkit (VTK), Point Cloud Library (PCL), Qt, SciPy  
**Frameworks:** Robotics Operating System (ROS)  
**Computer Vision:** OpenCV  
**Machine Learning:** WEKA, Scikit-learn, TensorFlow  
**Software Tools:** MATLAB  
**Version Control:** Git/Github  
**Markup Languages:** L<sup>A</sup>T<sub>E</sub>X, B<sub>I</sub>B<sub>T</sub>E<sub>X</sub>, HTML, XML  
**Databases:** MySQL, PostgreSQL

**LANGUAGES** **Spanish** (Native)  
**English** (Full Professional Proficiency)  
TOEFL (Test of English as a Foreign Language) result: 107/120  
**German** (Full Professional Proficiency)  
TestDaF (German as a Foreign Language) result: 17/20  
**French** (Elementary Proficiency)

**PROGRAMMING COMPETITIONS** **Google Hashcode** 2016 - 2018  
Team programming competition organized by Google for students and industry professionals across Europe, the Middle East and Africa.

**Google CodeJam** 2014 - 2015  
International programming competition hosted and administered by Google. It consists of a set of algorithmic problems which must be solved in a fixed amount of time.

**Microsoft Kinect Hackathon** Mar. 2015  
Thirty-six hours hackathon developing a prototype that brought Kinect into the world of Skype calls for educational purposes.

**VOLUNTEER EXPERIENCE** **ACM SIGGRAPH Asia, Student Volunteer** 2017 - 2018  
Support the SIGGRAPH Asia Conference Programs and Exhibition, and meet and learn from professionals, creators, educators, and visionaries in the industry.

**Edinburgh International Science Festival**, *Student Helper* 2017 - 2018  
Helper at the “*Marty: Activate!*” workshop that taught children (11+ years) to program a robot to interact with its surroundings using the programming language *Scratch*.

**FIRST LEGO League (FLL)**, *Robot Game Judge* 2016-2018  
Assess teams of young people (9-16 years) while solving a set of missions on a specialised field, using an autonomous robot built and programmed using LEGO MINDSTORMS

**INSPIRE Summer School**, *Student Helper* Jul. 2017  
Helper at the “*Fun with Robots*” workshop that introduced girls (15-16 years) to programming robots using LEGO MINDSTORMS.

**Cracking the Code**, *Student Helper* Jun. 2017  
Introduce girls (9-11 years) to programming a robot using LEGO MINDSTORMS, as part of a Equality Challenge Unit’s (ECU) project oriented to attract under-represented groups into subjects they don’t traditionally apply for.