

# Elizabeth Vargas

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CONTACT INFORMATION      Institute of Signals, Sensors and Systems  
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PROFESSIONAL EXPERIENCE      **ORCA Hub**      Jan. 2019 - Present  
*Research Associate*      Edinburgh, United Kingdom

- Computer Vision applied to Offshore Robotics for Certification of Assets (ORCA).
- Simultaneous Localisation And Mapping (SLAM) for underwater environments.
- Combination of Visual Odometry (VO) and Sensor Fusion methodologies (ROS).

**Toshiba Medical Visualization Systems**      Jun. 2015 - Sep. 2015  
*Research Intern with Corné Hoogendoorn*      Edinburgh, United Kingdom

- Alzheimer Disease (AD) characterisation using Magnetic Resonance Imaging (MRI).
- Performed feature selection, classification and regression (Python, Scikit-learn).
- Texture analysis in hippocampus tissue to diagnose AD.

**Philips Research Aachen**      Mar. 2011 - Jul. 2011  
*Research Intern with Martin Weibrecht*      Aachen, Germany

- Magnetic Resonance Imaging (MRI) applied to characterisation of liver diseases.
- Features extraction from Diffusion Weighted MRI relevant for disease diagnosis.
- Implementation of a gray level based iterative segmentation algorithm employing threshold derived from histogram analysis (MATLAB).

EDUCATION      **Ph.D. Signal Processing**      Oct. 2015 - Sep. 2019  
*Heriot-Watt University, United Kingdom*

- Acoustic source localisation in environments in which a constraint is present.
- Source localisation via direct optimisation reducing computation six fold (SciPy).
- Signal sampling implementation in the spectrogram for compressed transmissions.
- Improved training of neural networks for acoustic source localisation (TensorFlow).
- Thesis: "Acoustic Source Localisation in Constrained Environments".
- Advisors: 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".
- Advisor: Keith Goatman from Toshiba Medical Visualization Systems.

	<b>B.Sc. Computer Science</b> <i>Universidad del Valle, Colombia</i>	Aug. 2006 - Aug. 2012 GPA: 4.67/5.0
	<ul style="list-style-type: none"> <li>• Courses in algorithms, data structures, compilers and software engineering.</li> <li>• Projects including image processing (C/C++), search algorithms, optimisation, evolutionary algorithms, software development (Java) and databases (MySQL).</li> <li>• Thesis: “Pruning Estimated Corresponding Points by Delaunay Triangulation”.</li> <li>• Advisor: Maria Trujillo.</li> </ul>	
SELECTED PUBLICATIONS	<ul style="list-style-type: none"> <li>• <b>E. Vargas</b>, J. R. Hopgood, K. Brown, K. Subr, <i>A Compressed Encoding Scheme for Approximate TDOA Estimation</i>, in European Signal Processing Conference (<b>EU-SIPCO</b>), Rome, Italy, September 2018. (<b>Oral Presentation</b>)</li> <li>• <b>E. Vargas</b>, K. Brown, K. Subr, <i>Impact of Microphone Array Configurations on Robust Indirect 3D Acoustic Source Localization</i>, in International Conference on Acoustics, Speech and Signal Processing (<b>ICASSP</b>), Calgary, Canada, April 2018. (<b>Oral Presentation</b>)</li> </ul>	
DISTINCTIONS	<b>James Watt Scholarship</b> , <i>Heriot-Watt University</i> 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. <b>Erasmus Mundus Scholarship</b> , <i>European Commission</i> 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.	
TRAINING	<b>International Summer School on Deep Learning</b> Jul. 2018 Research training event aiming at updating participants about the most recent advances in the critical and fast developing area of deep learning. <b>International Computer Vision Summer School (ICVSS)</b> 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.	
TECHNICAL SKILLS	<b>Operative Systems:</b> Windows, Linux (ubuntu) <b>Programming Languages:</b> Python, C/C++, Java <b>Frameworks:</b> Robotics Operating System (ROS) <b>Computer Vision:</b> OpenCV, Point Cloud Library (PCL) <b>Machine Learning:</b> WEKA, SciPy, Scikit-learn, TensorFlow <b>Software Tools:</b> MATLAB <b>Version Control:</b> Git/Github <b>Markup Languages:</b> L <sup>A</sup> T <sub>E</sub> X, B <sub>I</sub> B <sub>T</sub> E <sub>X</sub> , HTML, XML	
VOLUNTEER EXPERIENCE	<b>Edinburgh International Science Festival</b> , <i>Student Helper</i> 2017 - 2018 Helper at the “ <i>Marty: Activate!</i> ” workshop that taught children (11+ years) to program a robot to interact with its surroundings using the programming language <i>Scratch</i> . <b>FIRST LEGO League (FLL)</b> , <i>Robot Game Judge</i> 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 <b>Cracking the Code</b> , <i>Student Helper</i> 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.	