

# Elizabeth Vargas

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CONTACT INFORMATION	Ouster One, St Colme Street Edinburgh, EH3 6AA United Kingdom	Website: <a href="https://evargasv.github.io/">https://evargasv.github.io/</a> Email: <a href="mailto:elizabeth.vargas@ouster.io">elizabeth.vargas@ouster.io</a> LinkedIn: <a href="https://www.linkedin.com/in/evargasv/">https://www.linkedin.com/in/evargasv/</a> Portfolio: <a href="https://github.com/evargasv">https://github.com/evargasv</a>
PROFESSIONAL EXPERIENCE	<b>Ouster/Sense Photonics</b> <i>Software Engineer</i>	Dec. 2020 - Present Edinburgh, United Kingdom <ul style="list-style-type: none"><li>• Ouster acquired Sense Photonics in October 2021 to establish <i>Ouster Automotive</i>.</li><li>• Develop algorithms for processing low- to mid-level data from a LiDAR system.</li><li>• Create a simulation environment to match real world measurements, and numerically refine and validate the developed algorithms (MATLAB, C++).</li><li>• Define and conduct experiments, and analyse data to test performance boundaries of the developed algorithms.</li></ul>
	<b>ORCA Hub</b> <i>Research Associate</i>	Jan. 2019 - Nov. 2020 Edinburgh, United Kingdom <ul style="list-style-type: none"><li>• Deployed a real-time computer vision system on a remotely operated underwater vehicle for the surveying and inspection of offshore assets (ROS, C++).</li><li>• Implemented Visual Simultaneous Localisation And Mapping (SLAM) solution for limited visibility underwater environments, based on data fusion from acoustic and optical sensors.</li><li>• Employed stereo cameras for 3D reconstruction of submerged structures, enabling the offshore industry to inspect and certify their integrity.</li></ul>
	<b>Toshiba Medical Visualization Systems</b> <i>Research Intern</i>	Jun. 2015 - Sep. 2015 Edinburgh, United Kingdom <ul style="list-style-type: none"><li>• Characterised Alzheimer disease using Magnetic Resonance Imaging (MRI), performing texture analysis in the hippocampus tissue enabling the diagnose the disease at various stages.</li><li>• Combined brain gyrus segmentation with regional texture metrics (Pandas).</li><li>• Applied machine learning to image texture, including feature selection, classification and regression techniques (Python, Scikit-Learn).</li></ul>
EDUCATION	<b>Ph.D. Signal Processing</b> <i>Heriot-Watt University, United Kingdom</i>	Oct. 2015 - Sep. 2019 <ul style="list-style-type: none"><li>• Advanced the state-of-the-art in acoustic source localisation in constrained environments through three major contributions (detailed below).</li><li>• Reduced computation six fold while maintaining localisation accuracy at state-of-the-art levels (Python, NumPy, SciPy).</li><li>• Implemented a signal sampling algorithm to achieve accurate localisation for a signal transmitted at a compression ratio of 40 : 1 (MATLAB).</li><li>• Applied deep learning techniques to achieve a 20% improvement in localisation accuracy by training a Convolutional Neural Network (CNN) using data augmentation from a Generative Adversarial Network (GAN) (Python, Keras, TensorFlow).</li></ul>

	<b>M.Sc. Computer Vision and Robotics with Distinction</b> Sep. 2013 - Jun. 2015 <i>University of Burgundy, France</i> GPA: 15.3/20 <ul style="list-style-type: none"> <li>• Joint Erasmus Mundus Master Program with <i>University of Burgundy</i> (France), <i>University of Girona</i> (Spain) and <i>Heriot-Watt University</i> (United Kingdom).</li> <li>• Basis of signal and image processing, medical image analysis (MATLAB).</li> <li>• Segmentation, multi-view geometry, object recognition and tracking (OpenCV).</li> <li>• Robot autonomy and intelligence, including SLAM and motion planning (ROS).</li> </ul>
	<b>B.Sc. Computer Science</b> Aug. 2006 - Aug. 2012 <i>Universidad del Valle, Colombia</i> 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> </ul>
SELECTED PUBLICATIONS	<b>E. Vargas</b> , R. Scona, J. Scharff Wilners, T. Luczynski, Y. Cao, S. Wang, Y. Petillot, <i>Robust Underwater Visual SLAM Fusing Acoustic Sensing</i> , in International Conference on Robotics and Automation ( <b>ICRA</b> ), Xian, China, June 2021.  <b>E. Vargas</b> , J. R. Hopgood, K. Brown, K. Subr, <i>On Improved Training of CNN for Acoustic Source Localisation</i> , accepted in Transactions on Audio, Speech, and Language Processing ( <b>TASLP</b> ), 2021.
DISTINCTIONS	<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>Operating Systems:</b> Windows, Linux (Ubuntu) <b>Programming:</b> Python, MATLAB, C/C++ <b>Robotics:</b> Robotics Operating System (ROS) <b>Computer Vision:</b> OpenCV <b>Machine Learning:</b> Scikit-Learn <b>Version Control:</b> Git/Github
VOLUNTEER EXPERIENCE	<b>Women in Computer Vision (WiCV) Workshop</b> , <i>Co-Organiser</i> Aug. 2020 Co-organised the WiCV workshop, designed to raise the visibility of female computer vision researchers, as part of the 16th European Conference in Computer Vision (ECCV).  <b>Edinburgh International Science Festival</b> , <i>Student Helper</i> 2017 - 2018 Helped 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 Assessed 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 MIND-STORMS