

Elizabeth Vargas

CONTACT INFORMATION	Ouster Automotive 125 Princes Street Edinburgh, EH2 4AD United Kingdom	Website: https://evargasv.github.io/ Email: elizabeth.vargas@ouster.io LinkedIn: https://www.linkedin.com/in/evargasv/ Portfolio: https://github.com/evargasv
PROFESSIONAL EXPERIENCE	Ouster Automotive <i>Software Engineer</i>	Dec. 2020 - Present Edinburgh, United Kingdom <ul style="list-style-type: none">• Develop algorithms for processing low- to mid-level data from a LiDAR system.• Create a simulation environment to match real world measurements, and numerically refine and validate the developed algorithms (MATLAB, C++).• Define and conduct experiments, and analyse data to test performance boundaries of the developed algorithms.
	ORCA Hub <i>Research Associate</i>	Jan. 2019 - Nov. 2020 Edinburgh, United Kingdom <ul style="list-style-type: none">• Deployed a real-time computer vision system on a remotely operated underwater vehicle for the surveying and inspection of offshore assets (ROS, C++).• Implemented Visual Simultaneous Localisation And Mapping (SLAM) solution for limited visibility environments, fusing data from acoustic and optical sensors.• Employed stereo cameras for 3D reconstruction of submerged structures, enabling the offshore industry to inspect and certify their integrity.
	Toshiba Medical Visualization Systems <i>Research Intern</i>	Jun. 2015 - Sep. 2015 Edinburgh, United Kingdom <ul style="list-style-type: none">• Characterised Alzheimer using Magnetic Resonance Imaging (MRI), performing texture analysis in brain tissue enabling the diagnose the disease at various stages.• Combined brain gyrus segmentation with regional texture metrics (Pandas).• Applied machine learning to image texture, including feature selection, classification and regression techniques (Python, Scikit-Learn).
EDUCATION	Ph.D. Signal Processing <i>Heriot-Watt University, United Kingdom</i>	Oct. 2015 - Sep. 2019 <ul style="list-style-type: none">• Advanced the state-of-the-art in acoustic source localisation (detailed below).• Reduced computation six fold while maintaining localisation accuracy at state-of-the-art levels (Python, NumPy, SciPy).• Implemented a signal sampling algorithm to achieve accurate localisation for a signal transmitted at a compression ratio of 40 : 1 (MATLAB).• Applied deep learning techniques to achieve a 20% improvement in localisation accuracy using data augmentation from a GAN (Python, Keras, TensorFlow).
	M.Sc. Computer Vision and Robotics with Distinction <i>University of Burgundy, France</i>	Sep. 2013 - Jun. 2015 GPA: 15.3/20 <ul style="list-style-type: none">• 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).• Basis of signal and image processing, medical image analysis (MATLAB).• Segmentation, multi-view geometry, object recognition and tracking (OpenCV).• Robot autonomy and intelligence, including SLAM and motion planning (ROS).

Aug. 2006 - Aug. 2012
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).

SELECTED PUBLICATIONS **E. Vargas**, R. Scona, J. Scharff Wilners, T. Luczynski, Y. Cao, S. Wang, Y. Petillot, *Robust Underwater Visual SLAM Fusing Acoustic Sensing*, in International Conference on Robotics and Automation (**ICRA**), Xian, China, June 2021.

E. Vargas, J. R. Hopgood, K. Brown, K. Subr, *On Improved Training of CNN for Acoustic Source Localisation*, accepted in Transactions on Audio, Speech, and Language Processing (**TASLP**), 2021.

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.

DISTINCTIONS	Erasmus Mundus Scholarship , <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.
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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.	
	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.	

TECHNICAL SKILLS

- Operating Systems:** Windows, Linux (Ubuntu)
- Programming:** Python, MATLAB, C/C++
- Robotics:** Robotics Operating System (ROS)
- Computer Vision:** OpenCV
- Machine Learning:** Scikit-Learn
- Version Control:** Git/Github

VOLUNTEER EXPERIENCE	Edinburgh International Science Festival, <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> .	
	FIRST LEGO League (FLL), <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	

ACADEMIC SERVICE	Organising Committee	
	• ECCV workshop on Women in Computer Vision (WiCV)	2020
	Academic Reviewer	
	• Conference on Computer Vision and Pattern Recognition (CVPR)	2022
	• International Conference on Robotics and Automation (ICRA)	2022
	• CVPR workshop on Women in Computer Vision (WiCV)	2018, 2019, 2020