

# Elizabeth Vargas

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CONTACT INFORMATION	14 Eliza Wigham Place Edinburgh, EH17 8YH United Kingdom	Website: <a href="https://evargasv.github.io/">https://evargasv.github.io/</a> Email: <a href="mailto:liz2102@gmail.com">liz2102@gmail.com</a> LinkedIn: <a href="https://www.linkedin.com/in/evargasv/">https://www.linkedin.com/in/evargasv/</a>
PROFESSIONAL EXPERIENCE	<b>Leap AI</b> <i>Senior Software Engineer</i>	Jan. 2023 - Present Edinburgh, United Kingdom <ul style="list-style-type: none"><li>• Computer vision and machine learning in a robotic system for product packing.</li><li>• Develop and deploy novel computer vision formulations, models, and algorithms for object segmentation, classification, and tracking (PyTorch/OpenCV).</li><li>• Design experiments for methodical data collection and analysis for vision pipelines.</li><li>• Work closely with cross-functional teams, ensuring the vision system's seamless integration and performance in the broader robot system (ROS).</li></ul>
	<b>Ouster Automotive</b> <i>Software Engineer</i>	Dec. 2020 - Oct. 2022 Edinburgh, United Kingdom <ul style="list-style-type: none"><li>• Ouster acquired <i>Sense Photonics</i> in 2021 and established <i>Ouster Automotive</i>.</li><li>• Performed statistical modelling and data analysis to support the design of 3D Flash LiDAR to be deployed within self-driving vehicles.</li><li>• Developed a simulation software that matches real world measurements employed to guide LiDAR design specifications (Python, Scipy, C++).</li><li>• Defined and perform experiments to test the performance boundaries of signal processing algorithms used to process data from the LiDAR system.</li></ul>
	<b>ORCA Hub</b> <i>Research Associate</i>	Jan. 2019 - Nov. 2020 Edinburgh, United Kingdom <ul style="list-style-type: none"><li>• Developed a real-time computer vision system, deployed 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 environments, fusing data 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 using Magnetic Resonance Imaging (MRI), performing texture analysis in brain tissue enabling the early diagnose of the disease.</li><li>• Combined brain gyrus segmentation with regional texture metrics (Pandas).</li><li>• Applied supervised machine learning techniques to image texture, including feature selection, classification and regression (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></ul>

- 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** Sep. 2013 - Jun. 2015  
*University of Burgundy, France* GPA: 15.3/20

- 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).
- Segmentation, multi-view geometry, object recognition and tracking (OpenCV).
- Robot autonomy and intelligence, including SLAM and motion planning (ROS).

**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).

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**), Xina, China, June 2021.

**E. Vargas**, J. R. Hopgood, K. Brown, K. Subr, *On Improved Training of CNN for Acoustic Source Localisation*, 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**, *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.

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 Languages:** Python, MATLAB, C/C++  
**Robotics:** Robotics Operating System (ROS), Gazebo, Rviz  
**Computer Vision:** OpenCV, Scikit-image  
**Machine Learning:** Numpy, Scipy, Scikit-learn, Pandas, PyTorch  
**DevOps:** Git, Docker  
**Agile Tools:** Jira, Confluence