Elizabeth Vargas

CONTACT INFORMATION

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PROFESSIONAL EXPERIENCE

ORCA Hub Jan. 2019 - Present
Research Associate Edinburgh, United Kingdom

- Computer Vision (CV) for Offshore Robotics for Certification of Assets (ORCA).
- Simultaneous Localisation And Mapping (SLAM) in underwater environments.
- Sensor Fusion of Visual Odometry (VO) with acoustic and inertial sensors *(ROS)*.

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

- Alzheimer disease characterisation using Magnetic Resonance Imaging (MRI).
- Texture analysis in hippocampus tissue to diagnose the disease at various stages.
- Performed feature selection, classification and regression *(Python, Scikit-learn)*.

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 neural networks training for acoustic localisation *(Keras, 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 *(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".
- Advisor: Maria Trujillo.

Selected Publications

- **E. Vargas**, J. R. Hopgood, K. Brown, K. Subr, *A Compressed Encoding Scheme for Approximate TDOA Estimation*, in 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)***

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.

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, 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, Keras, TensorFlow
Software Tools: MATLAB
Version Control: Git/Github
Markup Languages: LaTeX, BibTeX, HTML, XML

Volunteer Experience

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

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 Units (ECU) project aimed at attracting underrepresented groups into subjects they don't traditionally apply for.