Elizabeth Vargas

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Professional ORCA Hub EXPERIENCE Research Associate

Jan. 2019 - Present

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 Ltd

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 GmbH, Research Laboratories

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".
- Supervised by 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".
- Supervised by Dr. Keith Goatman from Toshiba Medical Visualization Systems.

B.Sc. Computer Science

Universidad del Valle, Colombia

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).
- Thesis: "Pruning Estimated Corresponding Points by Delaunay Triangulation".
- Supervised by Dr. Maria Trujillo.

SELECTED **PUBLICATIONS**

- E. Vargas, J. R. Hopgood, K. Brown, K. Subr, "A Compressed Encoding Scheme for Approximate TDOA Estimation", accepted to 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

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)

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

Operative Systems: Windows, Linux (ubuntu)

Programming Languages: Python, C/C++, Java Frameworks: Robotics Operating System (ROS)

Computer Vision: OpenCV, Point Cloud Library (PCL Machine Learning: WEKA, SciPy, Scikit-learn, 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 Unit's (ECU) project oriented to attract under-represented groups into subjects they don't traditionally apply for.