Francisco Girbal Eiras

Research Engineer at FiveAI

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FiveAI (Sep. 2018 - Present)

Research Engineer

Working on safe and robust solutions for Hierarchical Planning within the Motion Planning and Prediction team in Edinburgh, under the orientation of Dr. Subramanian Ramamoorthy.

Institute for Systems and Robotics, Lisbon (Apr. 2017 - Sep. 2017)

Graduate Research Assistant

Studied and developed new methods to perform pose estimation through vanishing points in general (central and non-central) omnidirectional cameras which lead to the publication of a paper in one of the top conferences in the field (CVPR'18).
Orientation: Dr. Pedro Miraldo

Institute for Systems and Robotics, Lisbon (Apr. 2016 - Sep. 2016)

Research Student (Undergraduate)

Constructed modules for gesture recognition using RGB-D cameras, from simple binary classification gestures (e.g. waving) to more complex ones (e.g. pointing estimation) and integrated them in a MOnarCH robot as part of the INSIDE project.
Orientation: Dr. Tiago Veiga

Education

University of Oxford, Linacre College (Oct. 2017 - Sep. 2018)

MSc Computer Science (Distinction)

Relevant courses: Computational Game Theory, Probabilistic Model Checking
Master Thesis: *"To Err is Human: Designing Correct-by-Construction Driver Assistance Systems using Cognitive Modelling"* under the orientation of Dr. Morteza Lahijanian and Prof. Marta Kwiatkowska

EPFL (Sep. 2016 - Feb. 2017)

Student Exchange (5.75/6)

Relevant courses: Applied Machine Learning, Image and Video Processing, Lab in Image and Signal Processing
Awarded a monthly scholarship under the Swiss-European Mobility Programme

Técnico Lisboa (Sep. 2013 - Jul. 2016)

BSc Electrical and Computer Engineering (18/20)

Relevant courses: Algorithms and Data Structures, Signals and Systems, Computational Mathematics, Automatic Control
Among top 2% of the class
Awarded an Academic Excelency Award every year and for the end of the BSc (3 years)

Publications

A Two-Stage Optimization Approach to Safe-by-Design Planning for Autonomous Driving
F Eiras, M Hawasly, SV Albrecht, S Ramamoorthy — arXiv preprint, arXiv:2002.02215, 2020

Integrating Planning and Interpretable Goal Recognition for Autonomous Driving
S. V. Albrecht, C. Brewitt, J. Wilhelm, F. Eiras, M. Dobre, S. Ramamoorthy — arXiv preprint, arXiv:2002.02277, 2020

PaRoT: A Practical Framework for Robust Deep Neural Network Training
E. Ayers, F. Eiras, M. Hawasly, I. Whiteside — 12th NASA Formal Methods Symposium, 2020 (To Appear)

Correct-by-Construction Advanced Driver Assistance Systems based on a Cognitive Architecture
F. Eiras, M. Lahajinan, M. Kwiatkowska — 2019 IEEE Connected and Automated Vehicles Symposium (Oral presentation)

Towards Provably Correct Driver Assistance Systems through Stochastic Cognitive Modeling
F. Eiras, M. Lahajinan — 2019 Robotics: Science and Systems - Workshop on Safe Autonomy

Analytical Modeling of Vanishing Points and Curves in Catadioptric Cameras
P. Miraldo, F. Eiras, S. Ramalingam — 2018 IEEE/CVF Conference on Computer Vision and Pattern Recognition

Technical Skills

Research Interests

Robotics
3D Vision
Mathematical Optimization
Robust Optimal Control
Formal Methods
Machine Learning
Neural Networks/Deep Learning

Programming/Frameworks

Python (TensorFlow, pyTorch, scikit-learn)
Matlab
C/C++
LaTeX
HTML/CSS/Javascript
POV-Ray

Language Skills

Portuguese (native)
English (fluent - 8.5 overall IELTS)
Spanish (elementary)
French: (elementary)

Accomplishments

2018 - Honourable mention at LauzHack 2018 for SolarRooftops project (using CV for social good)

2017 - ISR-Lisbon Graduate Research fellowship

2016 - Swiss-European Mobility Programme Studying abroad scholarship

2016 - Academic Excelency Award for BSc (over 3 years)

2016 - ISR-Lisbon Undergraduate Research studentship

2015/16 - Elected the Class representative for BSc and 3rd year

2013 - AFS International Scholarship worth $25,000

2013 - 3rd place at the Delaware State Science Olympiad in Data Analysis and Genetics