PEP LLUIS NEGRE

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plnegre.github.io

Principal Computer Vision Engineer

Experience

2024 - Current

High-Level Autonomy Team Lead

ROVCO Subsea, United Kingdom

Leading the development of world-class AI-driven subsea autonomy. Technically led and delivered the world-first autonomous inspection of an offshore jacket structure. Driving the end-to-end architecture and algorithmic design — from perception and sensor fusion to decision-making and mission autonomy. Leading a multidisciplinary tech team, setting technical direction, and ensuring delivery of high-impact, production-grade solutions.

2020 - 2024

Principal Computer Vision Engineer

ROVCO Subsea, United Kingdom

Researching and prototyping emerging computer vision technologies to guide subsea exploration and inspection. Designing and developing the core of Rovco's cutting-edge live 3D vision for ROVs and AUVs. Working on tackling challenging underwater imagery problems to keep improving camera pose accuracy and dense 3D models.

2017 - 2020

Senior Computer Vision Engineer

ROVCO Subsea, United Kingdom

Designing online 3D underwater mapping algorithms, based on an accurate Visual-SLAM positioning system and semi-dense 3D reconstructions. Developing cutting-edge solutions for reliable and impressive 3D underwater reconstructions to be executed online during the robot mission. Main contributor and inventor of Rovco's SubSLAM online 3D mapping sensor for subsea infrastructure. Delivering the most advanced subsea stereo camera system up to date.

2012 - 2017

Postgraduate Researcher

Systems, Robotics and Vision Group, University of the Balearic Islands, Spain

Co-responsible for the entire platform (software and hardware) of the autonomous underwater robot "Turbot". In charge of the whole localization pipeline based on various sensors: IMU, DVL, USBL, GPS and 2 stereo pairs. Specialized in stereo localization, loop closing detection and 3D reconstruction of the environment and the tools to visualize it.

Responsible for the design and development of the operating interface of the vehicle based on HTML5, Google maps API and Rosbridge.

2012 - 2015

CEO at Binibook.com

Binibook S.L.

Lead of the platform to write and distribute books online. In charge of the website and apps developed for iOS and Android. Create value, manage the group and keep developing code in HTML5, Javascript, CSS, PHP, NodeJS, Xcode and Java.

2011 - 2012

Software Developer

Sampol Comunications S.L.

Developing drivers for IAS/Wonderware, cameras, relies and many other sensors for factories and intelligent houses.

Implementing power monitoring systems to improve the building efficiency with powerful web front-ends and databases.

Responsible for the project of automatic reading of meters of water and electricity for the Palma de Mallorca Harbour's.

2009 - 2011

Control Engineer

Alstom Power S.L.U.

Responsible for the control design and tuning of the wind turbines ECO74 and ECO80.

Specialized in system identification and fault-tolerant control in adverse weather conditions.

Education

2008 - 2010	**Master Degree in Automation and Robotics**
	University of Catalonia UPC, Spain
	Advanced control techniques. Mobile robotics. Computer vision.
	Final grade: 8.23/10
2004 - 2008	**Industrial Engineer in Industrial Electronics**
	University of the Balearic Islands, Spain
	Computer vision. Robotics. Electronics. Control theory.
	Final grade: 6.74/10
2002 - 2004	**Bachelor Degree Scientific-technological**
	IES Guillem Colom Casasnovas, Soller, Spain

Skills

Tools & libraries

Expert in Linux command line, SSH, ROS2, OpenCV, PCL, ceres-solver, g2o, git and docker.

Robotics

14+ years of experience in subsea robotics. Highly focused on subsea autonomous robots, SLAM, sensor fusion and stereo vision-based localization systems. Delivered two world-class subsea technologies: SubSLAM live 3D sensor and offshore jacket structure autonomous inspection.

Software

Senior programmer in C++ and python.
High background in web, C#, Java and Matlab.

Languages

Spanish and Catalan native.
English.

Relevant Publications

P. L. Negre, F. Bonin-Font, G. Oliver. Global Image Signature for Visual Loop-Closure Detection. In Autonomous Robots, Published Online, Springer US, vol. 40, pp. 1403-1417, December 2016.

P. L. Negre, F. Bonin-Font, G. Oliver. Cluster-Based Loop Closing Detection for Underwater SLAM in Feature-Poor Regions. In IEEE International Conference on Robotics and Automation (ICRA), Stockholm (Sweeden), 2016. **BEST STUDENT PAPER AWARD FINALIST.**

P. L. Negre, F. Bonin-Font, M. Massot, G. Oliver. Stereo-Vision Graph-SLAM for Robust Navigation of the AUV SPARUS II. In IFAC Workshop on Navigation, Guidance and Control of Underwater Vehicles (NGCUV), Girona, 2015.

P. L. Negre, F. Bonin-Font, G. Oliver. Stereo Graph-SLAM for Autonomous Underwater Vehicles. In Intelligent Autonomous Systems 13 (Proceedings of the 13th International Conference on Intelligent Autonomous Systems IAS13), Padova/Venice, pp. 351-360, 2014.

Patents

- PL. Negre, E.D. Ruiz. 2023. Computing device and method for mapping. EP4471722A1. Filed May 31, 2023, published Dec 4, 2024 (pending).
- I. Wallace, PL. Negre, L. Hill. 2021. Computing device and method for video object detection. EP3651056. Filed Nov 6, 2018, and issued Mar 28, 2021.
- I. Wallace, L. Hill, PL. Negre, N. Read. 2020. Subsea surveying system. GB2582554. Filed Mar 21, 2019, and issued Sep 30, 2020.
- I. Wallace, L. Hill, PL. Negre N. Read. 2020. Surveying system for surveying in harsh environments. EP3712558. Filed Mar 21, 2019, and issued Sep 23, 2020.

- I. Wallace, L. Hill, B. Allen, PL. Negre. 2019. Subsea camera module and multi camera system. GB2570748. Filed Sep 4, 2018, and issued Aug 7, 2019.

Portfolio

Author/inventor or main contributor of:

- World-first AI-driven autonomous subsea jacket inspection (main inventor).

- SubSLAM live 3D mapping for subsea infrastructure (main inventor).

- Stereo Slam. A stereo camera SLAM system, based on my paper of ICRA'16. Nominated for the best student paper award (author)

- Libhaloc. A loop closure detection system, based on my Autonomous Robots journal paper (author).

- Contributions to ROS most popular visual odometers: viso2 and fovis.

- 3D mapping and reconstruction:

  * Rema (private repo). A full registration and mapping library for stereo cameras, using PnP for image to image registration, g2o for graph optimization and Ceres Solver for bundle adjustment.

  * Uware. Simple tool for image to image registration, based on PnP and ICP.

- 3D visualization

  * Pointcloud web viewer. A 3D pointcloud web viewer.

- Camera drivers: https://github.com/srv/pg_spinnaker_camera and https://github.com/srv/prosilica_driver

- Check my other public contributions over the last years from my Github account: https://github.com/plnegre.