CV date	12/05/2021

Part A. PERSONAL INFORMATION

First and Family name	Rafael García Campos		
ID number	40324529D	Age	51
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0002-1681-6229	
	SCOPUS Author ID (*)	35589706500	
	WoS Researcher ID (*)	N-3804-2015	

(*) Optional   (**) Mandatory

A.1. Current position

Name of University/Institution	University of Girona		
Department	Computer Vision and Robotics Institute		
Address and Country	C/ Universitat de Girona, 1, 17003, Girona, Spain		
Phone number	676511024	**E-mail**	rafael.garcia@udg.edu
Current position	Full Professor (Catedrático Univ.)	**From**	2019
Key words	Underwater Imaging, Computer Vision, Underwater Robotics		

A.2. Education

PhD, Licensed, Graduate	University	Year
Graduate	Universitat Autonoma de Barcelona	1994
PhD	Universitat de Girona	2001

A.3. General indicators of quality of scientific production *(see instructions)*

- Number of six-year research periods: 3 (last one in 2014) + 1 tech transfer period
- Number of PhD thesis supervised in the last 10 years: 8
- Total number of citations: 3978 (Google Scholar), H-index: 34
- Average citations/year for the last 5 years (excluding 2021): 401 (Google Scholar)
- Total number of publications in JCR (Q1): 34

Part B. CV SUMMARY *(max. 3500 characters, including spaces)*

Dr. Rafael Garcia received the engineering degree in computer science in 1994 from the Autonoma University of Barcelona (UAB), and the Ph.D. degree in computer engineering in 2001 from the University of Girona (UdG), Spain.

From March 2010 to June 2015 he was the director of the Computer Vision and Robotics Group (VICOROB) at the University of Girona, positioning VICOROB as the most productive research group at the University of Girona. In 2015 he converted VICOROB into a research institute. Prof. Garcia is also the founder and director of the Underwater Vision Lab, at the Computer Vision and Robotics Institute of UdG.

In 2019, Dr. Garcia was appointed full professor of Computer Vision, also at UdG. His research activity mainly focuses on underwater robotics in topics such as large-scale seafloor mapping, optical enhancement, sensor fusion, 3D reconstruction and image classification. More recently, he is applying his research in automatic mapping and change monitoring of the seabed to the early detection of skin cancer, also through high-resolution mapping and accurate change detection in naevi.

Prof. Garcia has published **three books**, **54 JCR-indexed** journal papers, 12 book chapters, and more than 150 papers in peer review international conferences. In the last 10 years, he

has participated in several national and transnational research projects, obtaining funding of 6.8 million euros. Among these projects prof. Garcia is or has been the principal investigator of projects for an amount of **5.4 million euros since 2010**. This includes five FP7 EU projects (EUROFLEETS2, MORPH, POLMOSAIC, Robocademy, MIDAS) and five H2020 projects (iToBoS, DeeperSense, Eurofleets+, EMODNet, ROBUST). He has also received funding from the USA, including SERDP and ESTCP projects funded by DoD / DoE / EPA (US Dept. of Defence, Dept. of Energy, Environmental Protection Agency).

Prof. Garcia has carried out research stays at Universität der Bundeswehr (Germany), University College Cork (Ireland), IRISA-INRIA (France), and the University of Miami (USA). In the last 10 years he has been invited to give **14 plenary talks** at international conferences. He has also participated as the main entrepreneur in the creation of **two startup companies** (Coronis Computing SL and Girona Vision Research SL), both based at the Technological Park of the University of Girona.

Finally, as illustration of the strength of his team in developing the most advanced underwater robots, it should be noted that prof. Garcia has guided and supervised the PhD students the Girona team that won the Field Robotics Competition ERL@Rescue in 2017, Eurathlon Grand Challenge in 2015 and the SAUCE competition of autonomous underwater robots in 2010 (and got the 2nd place in 2011). These competitions gather the best u/w robotics groups in the UE.

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications *(see instructions)*

- R. Campos, J. Quintana, **R. Garcia**, T. Schmitt, G. Spoelstra, D. Schaap (2020). Modern 3D simplification methods and large-scale terrain tiling. Remote Sensing, 12(3), 437. DOI: 10.3390/rs12030437

- K. Istenic, N. Gracias, A. Arnaubec, J. Escartin, **R. Garcia** (2020). Automatic scale estimation of structure from motion-based 3D models using laser scalers in underwater scenarios. ISPRS Journal of Photogrammetry and Remote Sensing 159, pp. 13-25. DOI: 10.1016/j.isprsjprs.2019.10.007

- K. Istenic, N. Gracias, A. Arnaubec, J. Escartin, **R. Garcia** (2019). Scale Accuracy Evaluation of image Based 3D Reconstruction Strategies using Laser Photogrammetry. Remote Sensing. 11(18), 2093. DOI: 10.3390/rs11182093

- **R. Garcia**, R. Prados, J. Quintana, A. Tempelaar, N. Gracias, S. Rosen, H. Vagstol and K. Lovall (2019). Automatic Segmentation of Fish using Deep Learning with Application to Fish Size Measurement. ICES Journal of Marine Science. DOI: 10.1093/icesjms/fsz186.

- R. Campos and **R. Garcia** (2018). Surface Meshing of Underwater Maps from Highly Defective Point Sets. Journal of Field Robotics, 35 (4), pp. 491-515. DOI: 10.1002/rob.21758

- C. Ancuti, C.O. Ancuti, C. De Vleeschouwer, **R. Garcia**. Locally Adaptive Color Correction for Underwater Dehazing and Image Matching, IEEE CVPR - NTIRE 2017 (*Best Paper Award*)

- R. Campos, **R. Garcia**, P. Alliez, M. Yvinec. "A Surface Reconstruction Method for In-Detail Underwater 3D Optical Mapping". The International Journal of Robotics Research, vol. 34 no. 1 64-89, January 2015. eISSN: 1741-3176, ISSN: 0278-3649. DOI: 10.1177/0278364914546536

- A. Elibol, J. Kim, N. Gracias, **R. Garcia**. "Efficient Image Mosaicing for Multi-robot Visual Underwater Mapping", Pattern Recognition Letters. Vol. 46, pp. 20–26, 2014. DOI: 10.1016/j.patrec.2014.04.020

- T. Nicosevici and **R. Garcia**. "Efficient 3D Scene Modeling and Mosaicing", Springer, 2013. ISBN 978-3-642-36417-4 (*Book*)

- T. Nicosevici and **R. Garcia.** (2012) Automatic Visual Bag-of-Words for Online Robot Navigation and Mapping," *IEEE Transactions on Robotics*, vol. 28, no. 4, pp. 886-898.

C.2. Research projects

- 2021-2024. H2020 Project "iToBoS: Intelligent Total Body Scanner for Early Detection of Melanoma" SC1-BHC-06-2020-965221 (1,138,875 €). PI: **R. Garcia** (and Consortium Coordinator; total Budget 12.1 M€; 19 partners)

- 2021-2023. H2020 Project "DeeperSense: Deep-Learning for Multimodal Sensor Fusion" H2020-ICT-2020-2-101016958 (475,000 €). PI: N. Gracias

- 2018-2022. H2020 Project "EUROFLEETS+: An alliance of European marine research infrastructure to meet the evolving needs of the research and industrial communities" H2020-INFRAIA-2018-1- (228,975 €). PI: **R. Garcia**

- 2018-2021. UDRONE: Intelligent UnDerwater Robot for Omnidirectional immersive beNthic Exploration. CTM2017-83075-R (226,270 €). PI: **R. Garcia**

- 2016-2019. H2020 Project "ROBUST: Robotic subsea exploration technologies". H2020-SC5-2015-690416 (609,875 €). PI: **R. Garcia**

- 2013-2017. FP7 EU Project "ROBOCADEMY: European Academy for Marine and Underwater Robotics". FP7-2013-ITN-608096. (226,681 €). PI: **R. Garcia**

- 2013-2017. FP7 EU Project "EUROFLEETS2: New Operational Steps towards an Alliance of European Research Fleets". FP7-2012-312762 (195,190€). PI: **R. Garcia**

- 2013-2016. FP7 EU Project "MIDAS: Managing Impacts of Deep-seA reSource exploitation". FP7-ENV-2013-603418. (146,100 €). PI: **R. Garcia**

- 2012-2015. MICINN-INNPACTO Project "PICMAR: Intelligent Platform for Multimodal Characterization of the Seafloor and Submerged Structures". IPT-2012-0463-310000 (281,441 €). PI: **R. Garcia**

C.3. Contracts, technological or transfer merits

- 2020-2021. Technology transfer contracts with Sulmara Subsea, Inc. (UK). "An Unmanned Maritime Data Acquisition and Intelligence Provision Service" (35,013€). PIs: **R. Garcia**, N. Gracias

- 2019-2020. Technology transfer contracts with Coronis Computing. "Development of a machine learning framework for image classification" (115,000€). PI: **R. Garcia**

- 2019-2020. Technology transfer contracts with Scantrol Deep Vision (Norway). "Deep Learning for detection and classification of fish in trawl nets" (33,600€). PI: **R. Garcia**

- 2012-2015. Technology transfer contract with OSSA "PABLITO: Predictive adaptive blasting in tunnel operation" (50,374€). PIs: **R. Garcia**, M. Sbert

- 2010-2012. Technology transfer contract within DoE-DoD joint programme, EEUU (subcontract through Univ. of Miami). "High Resolution Landscape (2-D) Mosaics for Improved Coral Reef Monitoring Capability" (US$93,212). PIs: **R. Garcia**, N. Gracias

- 2011-2012. Technology transfer contract with Nova Southeastern University "Development of Methods for Predicting 3D Geobodies from Thickness Data: Reconstructing Subsurface Uncertainty Using 3-D Markov Chain Models". (US$25,220). PIs: **R. Garcia**, N. Gracias

- 2010-2012. Technology transfer contract "Automatic video categorization system". INDRA SISTEMAS SA, DSET SL and LAVINIA SA (152,636 €). PI: **R. Garcia**

C.4. Plenary Conferences

- 2020: Plenary Talk at the Quantitative Monitoring of Underwater Environment Workshop, Brest, France. Title of the Talk: "Challenges of vision-based robotic ocean exploration".

- 2019: Keynote Speaker at the Underwater 3D Recording & Modelling Workshop, Limassol, Cyprus. Title of the talk: "Omnidirectional Underwater Computer Vision Research and Applications at the University of Girona".

- 2019: Keynote Speaker at the Initiative Bildverarbeitung Schleswig-Holstein, Kiel, Germany. Title of the talk: "Underwater Imaging: using Computer Vision for Mapping in a Participating Media".

- 2018: Keynote Talk at the 15th International Conference on Ubiquitous Robots. Honolulu, Hawaii, USA. Title of the talk: "Towards immersive benthic exploration using intelligent robots".
- 2018: Invited Speaker at the ISIC Skin Image Analysis Workshop and Challenge (MICCAI 2018). Granada, Spain. Title of the talk: "The role of total body photography in skin cancer detection: challenges and opportunities".
- 2016: Invited talk at the ICRA 2016 Workshop on Marine Robot Localization and Navigation. Stockholm, Sweden. Title of the talk: "Challenges for underwater perception and mapping using computer vision".
- 2015: Keynote talk at the 6th International Workshop on Computer Vision in Vehicle Technology, in conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR). Boston, USA. Talk: "Vision-based Robots to Explore the Ocean".
- 2015: Plenary Keynote Speaker at the 4th EOS Topical Meeting on Blue Photonics® - Optics in the Sea (Blue Photonics 4). Barcelona, Spain. Title of the talk: "High-Resolution Optical Seafloor Mapping and Characterization".
- 2014: Plenary Keynote Speaker at the Marine Imaging Workshop, National Oceanographic Centre Southampton, U.K. Title of the talk: "Underwater imaging: from nice evidence to useful data".
- 2014: Plenary Keynote Speaker at the International Symposium on Naval Architecture and Maritime (INT-NAM), Istanbul, Turkey. Title of the talk: "3-D Mapping for the Characterization of the Seafloor using an Underwater Robot within the MUMAP Project".
- 2013: Plenary Keynote Speaker at the Hispano-Brazilian Workshop on Autonomous Robots and Robotic Intelligence. Talk: "Underwater Robot for Autonomous Mapping".
- 2013: Plenary Keynote Speaker at the Symposia on Automation and Computation for Naval, Offshore and Subsea Industry (NAVCOMP'2013), Rio Grande do Sul, Brasil. Title of the talk: "Future trends in high-resolution benthic habitat mapping using autonomous underwater robots".
- 2012: Plenary Keynote Speaker at the Jornadas Argentinas de Robótica (JAR'2012), Olavarria, Argentina. Talk: "Underwater Robotics as a key tool for Seafloor Exploration"
- 2012: Plenary Keynote Speaker at the IFAC Workshop on Navigation, Guidance and Control of Underwater Vehicles (NGCUV'2012), Porto, Portugal. Title of the talk: "Challenges and Limitations of High-resolution Sea-floor Optical Mapping using UUVs".

C.5. Awards and Distinctions

- BEST PAPER AWARD at IEEE CVPR Workshop on New Trends in Image Restoration and Enhancement, 2017. NTIRE 2017.
- "1st place Award" as co-supervisor of the PhD student's team that participated at the Multi-domain Cooperation section (Land, Sea, Air), teaming with Telerob and INESC TEC for land and air, respectively, of the Field Robotics Competition ERL@Rescue 2017
- BEST STUDENT PAPER awarded to my PhD student Klemen Istenic at IEEE OCEANS Conference 2017, Aberdeen, UK.
- Winner of the Grand Challenge in the Eurathlon competition 2015 of autonomous underwater robots as supervisor of UdG's team.
- BEST PRESENTATION AWARD at the 4th International Workshop on Marine Technology (2011).
- "2nd PLACE AWARD" as co-supervisor of the PhD student's team that participated at the autonomous underwater robot competition SAUC-E (Student Autonomous Underwater Vehicle Challenge Europe), NURC NATO Centre, La Spezia, Italy (2011).
- "1ST PLACE AWARD" as co-supervisor of the student's team at the SAUC-E European competition for autonomous robots, NURC NATO Centre, La Spezia, Italy (2010).
- "BEST PAPER AWARD" at IEEE EDUCON'2010.