Curriculum Vitae

Prof. Miguel A. González Ballester, DPhil (Oxon.)

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Summary:

Prof. Miguel A. González Ballester holds a computer science degree from Universitat Jaume I, Spain (1996) and a doctoral degree from the University of Oxford, UK (2000). His doctorate, under supervision of Sir Michael Brady and Prof. Andrew Zisserman, focused on the development of algorithms for the analysis of brain MRI data for multiple sclerosis and schizophrenia. He was awarded the prestigious Toshiba Research Fellowship and moved to Japan to work for two years as a senior researcher at Toshiba Medical Systems, where he developed novel, patented systems for MRI parallel imaging. In late 2001 he obtained a faculty position at INRIA (Sophia Antipolis, France), where he led research projects on medical image analysis and mathematical modelling. In 2004 he joined the University of Bern (Switzerland), as head of the medical image analysis group, and later became head of the surgical technology division at the Faculty of Medicine. There, he supervised a division composed of 4 research groups working on medical image analysis, computer-assisted surgery (mainly for orthopaedics and CMF surgery), and surgical robotics. From 2008 until September 2013 he was in charge of the Research Department of the company Alma IT Systems in Barcelona (Spain), where he led the development of a new generation of computer tools for diagnosis and surgical planning. In October 2013 he was awarded an ICREA Research Professorship, and joined the Department of Engineering at Universitat Pompeu Fabra in Barcelona, where he founded the Barcelona Center for New Medical Technologies (BCN Medtech). He has more than 150 publications in peer-reviewed scientific journals and 350 conference publications, and has supervised to completion 27 PhD theses. He has led numerous research projects, including the ERC Synergy project Zee-Zoom-Zap. He is a regular contributor to scientific committees and journal review boards (IEEE TMI, IEEE TBME, Front. Radiol., etc.), and member of the programme committee of numerous conferences (MICCAI, CARS, ISBI...). He is also co-founder and scientific advisor of the company MiWEndo Solutions S.L., and a Visiting Scientist at the QUANTIC research group of Barcelona Supercomputing Center, where he focuses his research on quantum machine learning.

Contents

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Education

University of Oxford (UK)

PhD (DPhil)
Robotics Research Group, Department of Engineering Science
Oct. 1996 – Jan. 2000
PhD on computer-assisted medical image analysis, under the supervision of **Prof. Sir Michael Brady** and **Prof. Andrew Zisserman** from the Dept. of Engineering Science, in collaboration with **Prof. Timothy Crow** from the Clinical Neurology Department. Research carried out at the Medical Vision Lab of the Robotics Research Group, within the framework of the European research project BIOMORPH. Thesis title: "Morphometric Analysis of Brain Structures in MRI".

Honours:

EU BIOMORPH research grant, 1996-2000.

IBM / Green College computing scholarship, 1998-1999.

Universitat Jaume I, Castellón (Spain)

Computer Engineering
Oct. 1991 – Jul. 1996
Thesis: "*Analysis, design and development of a parametric surface renderer with textures, illumination and shading*". Supervisor: **Dr. Miguel Chover**.

Honours:

Grant for the promotion of research from the Spanish Ministry of Education and Science, 1995-1996.

Habilitation / Accreditation

Acreditació Avançada de Recerca (Catedràtic)

AQU Catalunya
Since 2011

Professional Experience

ICREA - Universitat Pompeu Fabra, Barcelona (Spain)

ICREA Research Professor
Head of the research group Simulation, Imaging and Modelling for Biomedical Systems (SIMBIOsys)
Director of the Barcelona Center for New Medical Technologies - BCN Medtech (2016-2023)
Head of Research, Department of Information and Communication Technologies (2015-2019)
Oct. 2013 – present
Research on medical image analysis and computer-assisted surgical interventions. Mathematical models of physiology and anatomy, statistical shape modelling, machine learning for computer vision and medical image analysis.

Barcelona Supercomputing Center, Barcelona (Spain)
Visiting Scientist
May 2023 – present
Research on quantum computing, as Visiting Scientist within the QUANTIC research group. Topics: quantum machine learning, quantum image processing, quantum-inspired machine learning algorithms, applications to healthcare. Group leader: **Dr. Artur Garcia Saez**.

MiWEndo Solutions S.L., Barcelona (Spain)
Co-Founder and Scientific Advisor
Sep 2019 – present
MiWEndo is a spin-off of UPF, UPC, Hospital Clínic & ICREA, focused on the development of a novel diagnostic device for colon cancer screening. In particular, we have developed an accessory device based on microwave imaging technology, that complements colonoscopes, with the potential to do in-situ tissue characterization.

Alma IT Systems S.L., Barcelona (Spain)
Chief Research Officer
May 2008 – Sep. 2013
Coordination and management of the Research Dept. of the company Alma IT Systems. Establishment of collaborations and management of national and European research projects. Development of new biomedical technologies, particularly for medical imaging. Company President: **Dr. Javier Herrero**.

MEM Research Center, Universität Bern (Switzerland)
Director of the Division of Surgical Technologies (from Jan. 2006)
Head of the Medical Image Analysis Group
Aug. 2004 – Apr. 2008
Computer-assisted surgery, statistical shape models, 3D ultrasound, 3D fluoroscopy, augmented reality, medical applications. MEM Center Director: **Prof. Lutz-Peter Nolte**.

INRIA, Sophia Antipolis (France)
Senior researcher (CR1) at the Epidaure Research Group
Dec. 2001 – Jul. 2004
Medical image analysis, segmentation, statistical shape models, registration, biomechanical models. Group director: **Prof. Nicholas Ayache**.

CERAVER S.A., Paris (France)
Scientific consultant
Nov. 2002 - Apr. 2003
Computer-assisted orthopaedic surgery.

Toshiba Medical Systems, Otawara (Japan)
Senior researcher at the MRI Research Group
Mar. 2000 – Oct. 2001
High-speed MRI algorithms. Development of “SPEEDER”, a patented technique for parallel imaging that was incorporated in Toshiba MRI devices worldwide. Group leader: **Dr. Yoshio Machida**.

University of Oxford, Dept. of Engineering Science
Medical Vision Lab., Robotics Research Group
Oct. 1996 – Feb. 2000
MRI image processing; automatic detection, segmentation and quantification of anatomical and pathological structures; computerised image understanding; surface and volume modelling for the representation of complex biological objects; visualisation and development of user interfaces for clinical use.

University of Oxford, Dept. of Clinical Neurology
Researcher / System Administrator
Oct. 1996 – Jan. 2000
Development of software for 3D medical image analysis. Clinical research on schizophrenia and multiple sclerosis. Design and development of image processing applications. Administration of UNIX systems.

Green College, Oxford
System Administrator
1998 – 1999
Network management, Windows NT system administrator.

Universitat Jaume I
Computer Graphics Group, Computer Science Dept.
Jul. 1995 – Jul. 1996
Visual realism; modelling and rendering of complex natural scenes by means of parametric surfaces and solid textures; visualisation, illumination and fast shadow casting techniques.

EDEFSOFT S.A., Castellón (Spain)
Analyst / Programmer
Nov. 1995 – Oct. 1996
Visual C++ and Visual Basic. Development of an OLE image server. Graphics formats and image processing.

Universitat Jaume I, Data Processing Centre
System Administrator (University placement)
Oct. 1994 – Jan. 1995
UNIX system administration. Development of Internet tools.

EDEFSOFT S.A.
Analyst / Programmer (University placement)
Nov
. 1993 – Mar. 1994
Windows software programming, using Microsoft Visual C++.

List of publications

Theses

1. González Ballester M.A. *Morphometric Analysis of Brain Structures in MRI*. PhD thesis. Robotics Research Group, Department of Engineering Science, University of Oxford, 1999 (Link - Oxford University Research Archive).

2. González Ballester M.A. *Computer-Aided MRI-Based Analysis of Brain Morphology*. PhD transfer thesis. University of Oxford, 1997.

3. González Ballester M.A. *Visualizador de Superficies Paramétricas con Texturas, Iluminación y Sombreado*. [*A Parametric Surface Renderer with Textures, Illumination, and Shadow-Casting*.] Degree thesis. Universitat Jaume I, Castellón (Spain), 1996.

Journal Articles

1. Zalevskyi V., Sanchez T., Kaandor M., Roulet M., Fajardo-Rojas D., Li L., Hutter J., Li H.B., Barkovich M., Koob M., Zeng Q., Karimi D., Peruzzo D., Ciceri T., Longari G., Elhassna Hamadache R., Bouzid A., Lladó Bardera X., Chiarella S., Martí-Juan G., González Ballester M.A., Castellaro M., Pinamonti M., Visani V., Cremese R., Sam K., Gaudfernau F., Ahir P., Parikh M., Zenk M., Baumgartner M., Maier-Hein K., Tianhong L., Hong Y., Zhao L., Preloznik D., Spiclin Z., Choi J.W., Li M., Fu J., Wang G., Jiang J., Tong L., Du B., Candela-Leal M.O., Gondova A., You S., Qayyum A., Mazher M., Niederer S.A., Yanko M., Specktor-Fadida B., Ben Bashat D., Jakab A., Licandro R., Payette K., Bach Cuadra M. Advances in automated fetal brain MRI segmentation and biometry: insights from the FeTA 2024 challenge. ***Medical Image Analysis*** (IF: 13.828, Q1), vol. 109(103941), pp. 1-22, 2026 (https://doi.org/10.1016/j.media.2026.103941).

2. Riera-Marin M., Kleiss J.-M., Aubanell A., Antolin A., Moreno-Vedia J., Rodriguez-Comas J., O.K. Sikha, May M., Garcia-Lopez J., Galdran A., González Ballester M.A. A multi-rater multi-organ abdominal CT dataset for calibration analysis and uncertainty modeling in segmentation. ***Scientific Data*** (IF: 8.501, Q1), 2026 (in press).

3. Natarajan S., Humbert L., González Ballester M.A. Learning high-resolution 3D spine mesh reconstruction from clinical anisotropic MRI through differentiable rendering. ***Expert Systems with Applications*** (IF: 7.5, Q1), vol. 301(130403), pp. 1-13, 2026 (https://doi.org/10.1016/j.eswa.2025.130403).

4. Natarajan S., Tiulpin A., Karppinen J., Humbert L., González Ballester M.A. MRI2Mesh: High-resolution intervertebral disc mesh generation from anisotropic MRI through attention-guided cross level graph feature fusion. ***IEEE Access*** (IF: 3.476, Q2), vol. 13, pp. 209282-209298, 2026 (https://doi.org/10.1109/ACCESS.2025.3638709).

5. Riera-Marín M., O.K. Sikha, Rodríguez-Comas J., May M., Pan Z., Zhou X., Liang X., Erick F.X., Prenner A., Hémon C., Boussot V., Dillenseger J.-L., Nunes J.-C., Qayyum A., Mazher M., Niederer S.A., Kushibar K., Martín-Isla C., Radeva P., Lekadir K., Barfoot T., Garcia Peraza Herrera L.C., Glocker B., Vercauteren T., Gago L., Englemann J., Kleiss J.M., Aubanell A., Antolin A., García-López J., González Ballester M.A., Galdrán A. Calibration and uncertainty for multirater volume assessment in multiorgan segmentation (CURVAS) challenge results. ***Computers in Biology and Medicine*** (IF: 6.3, Q1), vol. 197(111024), pp. 1-16, 2025 (https://arxiv.org/abs/2505.08685, https://doi.org/10.1016/j.compbiomed.2025.111024).

6. Madadi Y., Raja H., Vermeer K.A., Lemij H.G., Huang X., Kim E., Lee S., Kwon G., Kim H., Kim J., Galdran A., González Ballester M.A., Presil D., Aguilar K., Cavalcante V., Carvalho C., Sabino W.,

Oliveira M., Lin H., Apostolidis C., Katsaggelos A.K., Kubrak T., Casado García A., Heras J., Ortega M., Ramos L., Zhang P., Li Y., Zhang J., Jiang W., Conze P.-H., Lamard M., Quellec G., El Habib Daho M., Shaurya M., Varma A., Agrawal M., Yousefi S. JustRAIGS: justified referral in AI glaucoma screening challenge. ***IEEE Transactions on Medical Imaging*** (IF: 11.037, Q1), 2025 (https://doi.org/10.1109/TMI.2025.3596874).

7. Rasouligandomani M., del Arco A., Villa T., La Barbera L., González Ballester M.A., Galbusera F., Noailly J. Implant density reduction to avoid proximal junctional failure in adult spine surgery: computer models and simulations. ***North American Spine Society Journal*** (IF: 2.5, Q2), vol. 24(100770), pp. 1-16, 2025 (https://doi.org/10.1016/j.xnsj.2025.100770).

8. Sanchez T., Mihailov A., Koob M., Girard N., Manchon A., Valenzuela I., Gómez-Chiari M., Martí Juan G., Pron A., Eixarch E., Piella G., González Ballester M.A., Camara O., Dunet V., Auzias G., Bach Cuadra M. Biometry and volumetry in multi-centric fetal brain magnetic resonance imaging: assessing the bias of super-resolution reconstruction. ***Pediatric Radiology*** (IF: 2.3, Q2), vol. 55, pp. 2064-2075, 2025 (https://doi.org/10.1007/s00247-025-06347-7).

9. O.K. Sikha, Stone A., González Ballester M.A. Meta-UNet: enhancing skin-lesion segmentation with multi-modal feature integration and uncertainty estimation. ***International Journal of Computer Assisted Radiology and Surgery*** (IF: 3.421, Q2), vol. 20, pp. 1911-1922, 2025 (https://doi.org/10.1007/s11548-025-03490-2).

10. Martín-Saladich Q., Pareto Onghena D., Simó R., Ciudin A., de la Calle E., Aguadé-Bruix S., Roque A., Pizzi M.N., Cuéllar H., Roson-Gradaille N., Ramirez-Serra C., González Ballester M.A., Herance J.R. Brain [18F]FDG uptake patterns in type 2 diabetes: new phenotypes relating to biomarkers of cognitive impairment. ***Brain Communications*** (IF: 4.5, Q1), vol. 7(3 - fcaf213), pp. 1-13, 2025 (https://doi.org/10.1093/braincomms/fcaf213).

11. Martín-Saladich Q., Simó R., Ciudin A., Baguña J., Ramirez-Serra C., Aguadé-Bruix S., Roque A., Pizzi M.N., Cuéllar H., Roson-Gradaille N., González Ballester M.A., Pericàs J.M., Herance J.R. Phenotypic patterns of metabolic-dysfunction associated steatotic liver disease in type 2 diabetes: the impact of insulin. ***European Journal of Clinical Investigation*** (IF: 4.4, Q1), vol. 55(9), pp. e70050:1-15, 2025 (https://doi.org/10.1111/eci.70050).

12. O.K. Sikha, Riera-Marin M., Galdran A., García J., Rodríguez-Comas J., Piella G., González Ballester M.A. Uncertainty-aware segmentation quality prediction via deep learning Bayesian modeling: comprehensive evaluation and interpretation. ***Computerized Medical Imaging and Graphics*** (IF: 7.422, Q1), vol. 123(102547), pp. 1-12, 2025 (https://doi.org/10.1016/j.compmedimag.2025.102547).

13. Martín Saladich Q., Simó R., Herance J.R., González Ballester M.A. MIRA: Myocardial insulin resistance app for clinical practice. ***Computer Methods and Programs in Biomedicine*** (IF: 7.027, Q1), vol. 263(108674), pp. 1-8, 2025 (https://doi.org/10.1016/j.cmpb.2025.108674).

14. Torra-Ferrer N., Montserrat Duh M., Grau-Ortega Q., Cañadas-Gómez D., Moreno-Vedia J., Riera-Marín M., Aliaga-Lavrijsen M., Serra-Prat M., García López J., González Ballester M.A., Fernández-Planas M.T.; Rodríguez-Comas J. Machine Learning-driven radiomics analysis for distinguishing mucinous and non-mucinous pancreatic cystic lesions: a multicentric study. ***Journal of Imaging*** (IF: 2.7, Q3), vol. 11(68), pp. 1-24, 2025 (https://doi.org/10.3390/jimaging11030068).

15. O.K. Sikha, González Ballester M.A., Benitez R. Unveiling learning trends in CNNs with Dynamic Mode Decomposition. ***Engineering Applications of Artificial Intelligence*** (IF: 7.5, Q1), vol. 144(110146), pp. 1-13, 2025 (https://doi.org/10.1016/j.engappai.2025.110146).

16. Urru A., Benkarim O., Marti G., Hahner N., Piella G., Eixarch E., González Ballester M.A. Longitudinal assessment of abnormal cortical folding in fetuses and neonates with isolated non-severe ventriculomegaly. ***Brain and Behavior*** (IF: 2.6, Q2), vol. 15(e70255), pp. 1-13, 2025 (https://doi.org/10.1002/brb3.70255).

17. Comte V., Alenyà M., Urru A., Recober J., Nakaki A., Crovetto F., Camara O., Gratacós E., Eixarch E., Crispi F., Piella G., Ceresa M., González Ballester M.A. Deep cascaded registration and weakly-supervised segmentation of fetal brain MRI. ***Heliyon*** (IF: 3.4, Q1), vol. 11(1), pp. e40148:1-18, 2025 (https://doi.org/10.1016/j.heliyon.2024.e40148).

18. Natarajan S., Humbert L., González Ballester M.A. Domain adaptation using AdaBN and AdaIN for high-resolution IVD mesh reconstruction from clinical MRI. ***International Journal of Computer Assisted Radiology and Surgery*** (IF: 3.421, Q2), vol. 19, pg. 2063-2068, 2024 (https://doi.org/10.1007/s11548-024-03233-9).

19. Fiorentino M.C., Villani F.P., Benito Herce R., González Ballester M.A., Mancini A., López-Linares Román K. An intensity-based self-supervised domain adaptation method for intervertebral disc segmentation in magnetic resonance imaging. ***International Journal of Computer Assisted Radiology and Surgery*** (IF: 3.421, Q2), vol. 19, pg. 1753-1761, 2024 (https://doi.org/10.1007/s11548-024-03219-7).

20. Rasouligandomani M., del Arco A., Chemorion F.K., Bisotti M.A., Galbusera F., Noailly J., González Ballester M.A. Dataset of finite element models of normal and deformed thoracolumbar spine. ***Scientific Data*** (IF: 8.501, Q1), vol. 11(549), pp. 1-20, 2024 (https://doi.org/10.1038/s41597-024-03351-8).

21. Martín-Saladich Q., Pericàs J.M., Ciudin A., Ramirez-Serra C., Escobar M., Rivera-Esteban J., Aguadé-Bruix S., González Ballester M.A., Herance J.R. Metabolic-associated fatty liver voxel-based quantification on CT images using a contrast adapted automatic tool. ***Medical Image Analysis*** (IF: 13.828, Q1), vol. 95(103185), pp. 1-11, 2024 (https://doi.org/10.1016/j.media.2024.103185).

22. Yap M.H., Byra M., Cassidy B., Liao T.-Y., Yi H., Galdran A., Chen Y.-H., Brungel R., Koitka S., Friedrich C.M., Lo Y.-W., Yang C.-H., Li K., Lao Q., González Ballester M.A., Carneiro G., Ju Y.-J., Huang J.-D., Pappachan J.M., Reeves N.D., Chandrabalan V., Dancey D., Kendrick C. Diabetic foot ulcers segmentation challenge report: benchmark and analysis. ***Medical Image Analysis*** (IF: 13.828, Q1), vol. 94(103153), pp. 1-14, 2024 (https://doi.org/10.1016/j.media.2024.103153).

23. Tassani S., Chaves P., Beardsley M., Vujovic M., Ramirez J., Mendoza J., Portero Tresserra M., González Ballester M.A., Hernandez-Leo D. Breathing, postural stability, and psychological health: a study to explore triangular links. ***Frontiers in Bioengineering and Biotechnology*** (IF: 6.064, Q1), vol. 12(1347939), pp. 1-14, 2024 (https://doi.org/10.3389/fbioe.2024.1347939).

24. De Vente C., Vermeer K.A., Jaccard N., Wang H., Sun H., Khader F., Truhn D., Aimyshev T.,; Zhanibekuly Y., Le T.-D. Galdran A., González Ballester M.A., Carneiro G., Devika R.G., Hrishikesh P.S., Puthussery D., Liu H., Yang Z., Kondo S., Kasai S., Wang E., Durvasula A., Heras J., Zapata M.A., Araújo T., Aresta G., Bogunovic H., Arikan M., Lee Y.C., Cho H.B., Choi Y.H., Imran Razzak A.Q., van Ginneken B., Lemij H.G., Sanchez C.I. AIROGS: Artificial intelligence for robust glaucoma screening challenge. ***IEEE Transactions on Medical Imaging*** (IF: 11.037, Q1), vol. 43(1), pp. 542-557, 2024 (https://doi.org/10.1109/TMI.2023.3313786).

25. Masias M., Ramirez-Mahaluf J.P., Valli I., Ortuño M., Ilzarbe D., De la Serna E., Puig-Navarro O., Crossley N., González Ballester M.A., Baeza I., Piella G., Castro-Fornieles J., Sugranyes G. Altered temporal dynamics of resting-state fMRI in early-onset first-episode psychosis. ***Schizophrenia Bulletin*** (IF: 6.6, Q1), vol. 50(2), pp. 418-426, 2024 (https://doi.org/10.1093/schbul/sbad107).

26. Ali S., Ghatwary N., Jha D., Isik-Polat E., Polat G., Yang C., Li W., Galdran A., González Ballester M.A., Thambawita V., Hicks S., Poudel S., Lee S.W., Jin Z., Gan T., Yu C. Yan J., Yeo D., Lee H., Tomar N.K., Haithmi M., Ahmed A., Riegler M.A., Daul C., Halvorsen P., Rittscher J., Salem O.E., Lamarque D., Cannizzaro R., Realdon S., de Lange T., East J.E. Assessing generalisability of deep learning-based polyp detection and segmentation methods through a computer vision challenge. ***Scientific Reports*** (IF: 4.996, Q2), vol. 14, no. 2032, pp. 1-16, 2024 (https://arxiv.org/abs/2202.12031, https://doi.org/10.1038/s41598-024-52063-x).

27. Nakaki A., Crovetto F., Urru A., Piella G., Borras R., Comte V., Vellvé K., Paules C., Segalés L., Dacal M., Gomez Y., Youssef L., Casas R., Castro-Barquero S., Martín-Asuero A., Oller T., Morilla I., Martínez-Àran A., Camacho A., Pasqual M., Arranz A., Rebollo-Polo M., Gomez-Chiari M., Bargalló N., Pozo O., Gomez-Gomez A., Izquierdo M., Eixarch E., Vieta E., Estruch R., Crispi F., González Ballester M.A., Gratacós E. Effects of Mediterranean diet or mindfulness-based stress reduction on fetal and neonatal brain development - A secondary analysis of a randomized clinical trial. ***American Journal of Obstetrics & Gynecology MFM*** (IF: 6.3, Q1), vol. 5(12), pp. 101188:1-11, 2023 (https://doi.org/10.1016/j.ajogmf.2023.101188).

28. Rasouligandomani M., del Arco A., Pellisé F., González Ballester M.A., Galbusera F., Noailly J. Proximal junction failure in spine surgery: integrating geometrical and biomechanical descriptors improves GAP score-based assessment. ***Spine*** (IF: 3.241, Q2), vol. 48(15), pp. 1072-1081, 2023 (https://doi.org/10.1097/BRS.0000000000004630).

29. Martín Saladich Q., Simó R., Aguadé-Bruix S., Simó-Servat O., Aparicio-Gómez C., Hernández C., Ramírez-Serra C., Nazarena Pizzi M., Roque A., González Ballester M.A., Herance J.R. Insights into insulin resistance and calcification in the myocardium in type 2 diabetes: a coronary artery analysis. ***International Journal of Molecular Sciences*** (IF: 6.208, Q1), vol. 24(4), pp. 3250:1-15, 2023 (https://doi.org/10.3390/ijms24043250).

30. Urru A., Nakaki A., Benkarim O., Crovetto F., Segales L., Comte V., Hahner N., Eixarch E., Gratacós E., Crispi F., Piella G., González Ballester M.A. An automatic pipeline for atlas-based fetal and neonatal brain segmentation and analysis. ***Computer Methods and Programs in Biomedicine*** (IF: 7.027, Q1), vol. 230(107334), pp. 1-14, 2023 (https://doi.org/10.1016/j.cmpb.2023.107334).

31. Cetin I., Stephens M., Camara O., González Ballester M.A. Attri-VAE: Attribute-based interpretable representations of medical images with variational autoencoders. ***Computerized Medical Imaging and Graphics*** (IF: 7.422, Q1), vol. 104(102158), pp. 1-13, 2023 (https://doi.org/10.1016/j.compmedimag.2022.102158).

32. Bernardino G., Sepúlveda-Martínez A., Rodríguez-López M., Prat-Gonzalez S., Pajuelo C., Perea R.J., Caralt M.T., Crovetto F., González Ballester M.A., Sitges M., Gratacós E., Bijnens B., Crispi F. Association of central obesity with unique cardiac remodeling in young adults born small for gestational age. ***European Heart Journal: Cardiovascular Imaging*** (IF: 9.130, Q1), vol. 24(7), pp. 930-937, 2023 (https://doi.org/10.1093/ehjci/jeac262).

33. Perera-Bel E., Aycock K.N., Salameh Z., Gómez-Barea M., Davalos R.V., Ivorra A., González Ballester M.A. PIRET - A platform for treatment planning in electroporation-based therapies. ***IEEE Transactions on Biomedical Engineering*** (IF: 4.756, Q2), vol. 70(6), pp. 1902-1910, 2023 (https://doi.org/10.1109/TBME.2022.3232038).

34. Jiménez-Sánchez A., Tardy M., González Ballester M.A., Mateus D., Piella G. Memory-aware curriculum federated learning for breast cancer classification. ***Computer Methods and Programs in Biomedicine*** (IF: 7.027, Q1), vol. 229(107318), pp. 1-10, 2023 (https://doi.org/10.1016/j.cmpb.2022.107318).

35. Rafael-Palou X., Aubanell A., Ceresa M., Ribas V., Piella G., González Ballester M.A. Prediction of lung nodule progression with an uncertainty-aware hierarchical probabilistic network. ***Diagnostics*** (IF: 3.922, Q2), vol. 11(12), pp. 2639:1-18, 2022 (https://doi.org/10.3390/diagnostics12112639).

36. Herance J.R., Martín-Saladich Q., Velásquez M.A., Hernández C., Aparicio C., Ramirez-Serra C., Ferrer R., Giralt-Arnaiz M., González Ballester M.A., Pericàs J.M., Castell-Conesa J., Aguadé-Bruix S., Simó R. Identification of myocardial insulin resistance by using liver tests: a simple approach for clinical practice. ***International Journal of Molecular Sciences*** (IF: 6.208, Q1), vol. 23(15), pp. 8783:1-12, 2022 (https://doi.org/10.3390/ijms23158783).

37. Segarra-Queralt M., Neidlin M., Tio L., Monfort J., Monllau J.C., González Ballester M.A., Alexopoulos L., Piella G., Noailly J. Regulatory network-based model to simulate the biochemical

regulation of chondrocytes in healthy and osteoarthritic environment. ***Scientific Reports*** (IF: 4.996, Q2), vol. 12(3856), pp. 1-16, 2022 (https://doi.org/10.1038/s41598-022-07776-2).

38. Tassani S., Tio L., Castro-Domínguez F., Monfort J., Monllau J.C., González Ballester M.A., Noailly J. Relationship between the choice of clinical treatment, gait functionality and kinetics in patients with comparable knee osteoarthritis. ***Frontiers in Bioengineering and Biotechnology*** (IF: 6.064, Q1), vol. 10(820186), pp. 1-12, 2022 (https://doi.org/10.3389/fbioe.2022.820186).

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Technical Reports

1. Comte V., Bertolini L., Hulsman R., Consoli S., Leoni G., Zanca F., Rafael X., Veronesi E., Piella G., González Ballester M.A., Querci M., Ceresa M., Wiesenthal T. AI-driven innovation in medical imaging - focus on lung cancer and cardiovascular diseases. **JRC Report**, no. JRC111773, 2025 (https://publications.jrc.ec.europa.eu/repository/handle/JRC142224).

2. López-Linares K., García I., García-Familiar A., Macía I., González Ballester M.A. 3D convolutional neural network for abdominal aortic aneurysm segmentation. ArXiv preprint 1903.00879, 2019 (https://arxiv.org/abs/1903.00879).

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5. Zhang C., Wang S., González Ballester M.A., Yarkony J. Efficient column generation for cell detection and segmentation. ArXiv preprint 1709.07337, 2017.

6. Wang S., Zhang C., González Ballester M.A., Yarkony J. Efficient pose and cell segmentation using column generation. ArXiv preprint 1612.00437, 2016.

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Funded research projects

Project title: Zee-zoom-zap: a novel paradigm for cancer theranostics

Funding entity: EU (ERC Synergy)

Project budget: 10.000.000,00 €; Group funding: 1.983.358,00 €

From 1/4/2026 until 31/3/2032

Coordinators: Andreas Kjaer (University of Copenhagen), Peter Andersen (DTU), Caglar Ataman (Albert-Ludwigs Universitaet Freiburg), Miguel A. González Ballester (ICREA-UPF)

Project title: SafeICP - Non-invasive photonic platform for bedside detection of intracraneal hypertension and other anomalies of cerebrospinal fluid dynamics

Funding entity: MICINN (AEI Lineas Estratégicas).

Project budget: 1.174.253,00 €; Group funding: 129.375,00 €

From 1/12/2022 until 30/11/2025

Coordinator: Turgut Durduran (ICFO)

Project title: Non-invasive early diagnosis of abdominal cancer, and prediction of its evolution by means of AI

Funding entity: MICINN (Proyectos en Colaboración Público-Privada). Project ID: CPP2021-008364

Project budget: 461.696,40 €; Group funding: 194.146,00 €

From 1/9/2022 until 31/8/2025

Coordinator: Sara Toledano (Sycai Technologies S.L.) & Miguel A. González Ballester (ICREA-UPF)

Project title: Bone strength analysis for osteoporosis management and fracture prevention

Funding entity: MICINN (Proyectos en Colaboración Público-Privada). Project ID: CPP2021-008574

Project budget: 1.053.404,67 €; Group funding: 364.727,39 €

From 1/3/2022 until 28/2/2025

Coordinator: Ludovic Humbert (3D Shaper S.L.) & Jérôme Noailly (UPF)

Project title: Abdominal medical image enhancement through deep learning techniques

Funding entity: AGAUR (Industrial Doctorates). Project ID: 2014 DI 034

Project budget: 55.560,00 €; Group funding: 33.960,00 €

From 6/9/2021 until 5/9/2024

Coordinator: Miguel A. González Ballester (ICREA-UPF) & Javier García López (Sycai Technologies S.L.)

Project title: Augmented reality surgical training valorization (ASTRAVAL)

Funding entity: UPF (INNOValora).

Project budget: 30.000 €; Group funding: 30.000 €

From 1/5/2021 until 31/12/2021

Coordinator: Mario Ceresa & Miguel A. González Ballester (ICREA-UPF)

Project title: Lung cancer detection platform

Funding entity: Italian Institute for Innovation (BRIC)

Project budget: 422.500,00 €; Group funding: 114.730,00€
From 19/2/2021 until 18/2/2023
Coordinator: Mario Ceresa (UPF)

Project title: Uncertainty estimation in cardiac image analysis (UNCARIA)
Funding entity: EU (H2020 MCSA)
Project budget: 224.071,20€; Group funding: 224.071,20€
From 1/9/2021 until 29/2/2024
Coordinator: Miguel Ángel González Ballester (ICREA-UPF)

Project title: Mixed reality integrated imaging for foetal interventions (ASTRA)
Funding entity: EPIC Games (EPIC MegaGrants)
Project budget: 40.074,06 €; Group funding: 40.074,06 €
From 1/12/2020 until 30/11/2021
Coordinator: Mario Ceresa (UPF)

Project title: Breathing dynamic modelling for body mind interaction in students (BYMBOS)
Funding entity: UPF (Planetary Wellbeing)
Project budget: 20.000 €; Group funding: 20.000 €
From 1/10/2020 until 23/12/2022
Coordinator: Simone Tassani (UPF)

Project title: Numerical simulation of cochlear and vestibular stimulation (CoVEST)
Funding entity: MINECO (Retos Investigación)
Project budget: 298.749,00 €; Group funding: 170.489,00 €
From 1/6/2020 until 31/5/2023
Coordinator: Miguel Ángel González Ballester (ICREA-UPF)

Project title: Estimation of the mechanical resistance of the spine for the prevention of osteoporotic fractures (ANDAMIO)
Funding entity: MINECO (Retos Colaboración)
Project budget: 565.283,26 €; Group funding: 180.665,26 €
From 1/1/2020 until 30/9/2022
Coordinator: Jérôme Noailly (UPF) / Ludovic Humbert (Galgo Medical S.L.)

Project title: Training network to advance integrated computational simulations in translational medicine, applied to intervertebral disc degeneration (Disc4all)
Funding entity: EU (H2020 MCSA ITN)
Project budget: 3.996.776,52€; Group funding: 501.809,76€
From 1/11/2020 until 31/10/2024
Coordinator: Jérôme Noailly (UPF).

Project title: Research, Development and Innovation Network for Health Technologies (XarTEC SALUT)
Funding entity: AGAUR (Xarxes d'R+D+I)

Project budget: 1.338.250,00€; Group funding: in kind - support for innovation activities
From 15/8/2020 until 31/12/2022
Coordinator: Alexandre Perera Lluna (CREB-Universitat Politècnica de Catalunya)

Project title: Paediatric Innovation Hub (i4KIDS)
Funding entity: AGAUR (Xarxes d'R+D+I)
Project budget: 548.629,17€; Group funding: in kind - support for innovation activities
From 1/7/2020 until 31/12/2022
Coordinator: Jaume Pérez Payarols (Hospital Sant Joan de Déu)

Project title: Interactive policy explorer for planetary wellbeing (IPER)
Funding entity: UPF (Planetary Wellbeing)
Project budget: 20.000 €; Group funding: 11.600 €
From 19/12/2019 until 31/12/2020
Coordinator: Mario Ceresa (UPF)

Project title: Automatic classification of prostate cancer risk via radiomics and machine learning in PET/MRI (ADUR)
Funding entity: ACC1Ó (Nuclis)
Project budget: 284.456,05 €; Group funding: 30.000 €
From 1/9/2019 until 31/12/2020
Coordinator: José Ramón García (CETIR) / Miguel Ángel González Ballester (ICREA-UPF)

Project title: Multimodality integrated imaging for foetal intervention (MIIFI)
Funding entity: EU (H2020 Attract)
Project budget: 100.000 €; Group funding: 44.375 €
From 20/5/2019 until 19/5/2020
Coordinator: Mario Ceresa (UPF) & Miguel Ángel González Ballester (ICREA-UPF)

Project title: Causative mechanisms & integrative models linking early-life-stress to psycho-cardio-metabolic multi-morbidity (earlyCause)
Funding entity: EU (H2020)
Project budget: 5.999.967,50 €; Group funding: 751.875 €
From 1/1/2020 until 31/12/2023
Coordinator: Karim Lekadir (UPF)

Project title: Surgical planning and navigation systems for irreversible electroporation cancer treatment
Funding entity: MINECO (FPI-MdM)
Project budget: 92.750 €; Group funding: 92.750 €
From 29/11/2017 until 28/11/2020
Coordinator: Miguel Ángel González Ballester (ICREA-UPF) & Antoni Ivorra (UPF)

Project title: Cell segmentation and tracking
Funding entity: Fundació La Caixa (INPhINIT)

Project budget: 115.092 €; Group funding: 115.092 €

From 29/11/2017 until 28/11/2020

Coordinator: Miguel Ángel González Ballester (ICREA-UPF)

Project title: Functional Real-time Automatic Microwave Endoscopy (FRAME)

Funding entity: Fundación Botin (MindTheGap)

Project budget: 500.000 €; Group funding: 500.000 €

From 1/9/2019 until 31/8/2020

Coordinator: Miguel Ángel González Ballester (ICREA-UPF)

Project title: Development of a new diagnostic and prognostic methodology for ascending aorta pathologies using PET-MRI (BIOmPET)

Funding entity: ACC1Ó (Innotec)

Project budget: 110.500 €; Group funding: 28.000 €

From 26/3/2019 until 31/8/2020

Coordinator: José Ramón García (CETIR) / Jérôme Noailly (UPF) & Miguel Ángel González Ballester (ICREA-UPF)

Project title: An EU-Canada joint infrastructure for next-generation multi-Study Heart research (euCanShare)

Funding entity: EU (H2020). Project ID: 825903

Project budget: 6.0390.980 €; Group funding: 860.000 €

From 1/12/2018 until 30/11/2022

Coordinator: Karim Lekadir (UPF)

Project title: Tecnio BCN Medtech (3rd year)

Funding entity: ACC1Ó (Tecnio). Project ID: TECDTP18_1_0012

Project budget: 30.000 €; Group funding: 30.000 €

From 3/5/2018 until 3/5/2019

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: INNOValora CIplanner

Funding entity: UPF (INNOValora). Project ID: INNOV1702-1

Project budget: 30.000 €; Group funding: 30.000 €

From 1/4/2018 until 31/3/2019

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Deep learning for lung nodule detection

Funding entity: AGAUR (Doctorat Industrial). Project ID: 2017 DI 087

Project budget: 8.472 €; Group funding: 8.472 €

From 8/2/2018 until 7/2/2021

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: SGR BCN Medtech

Funding entity: AGAUR (SGR). Project ID: 2017 SGR 1386

Project budget: 36.000 €; Group funding: 36.000 €

From 1/1/2017 until 31/12/2020

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Modelado multiescala mecánico y biológico de los mecanismos de progresión avanzada de la enfermedad pulmonar obstructiva crónica basado en evidencias clínicas (INSPIRE)

Funding entity: MINECO (Retos Investigación). Project ID: FIS2017-89535-C2-2-R

Project budget: 128.381 €; Group funding: 128.381 €

From 1/1/2018 until 31/12/2020

Coordinator: Jérôme Noailly (UPF)

Project title: Tecnio BCN Medtech (2nd year)

Funding entity: ACC1Ó (Tecnio)

Project budget: 37.176 €; Group funding: 37.176 €

From 5/1/2017 until 30/4/2018

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: MiWEndo

Funding entity: UPF (Innovation Award)

Project budget: 10.000 €

From 1/10/2017 until 30/9/2018

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: CIplanner: cochlear implant surgical planning system

Funding entity: ACC1Ó (Producte). Project ID: 2016 PROD 00047

Project budget: 99.711,95 €; Group funding: 99.711,95 €

From 3/10/2017 until 2/4/2019

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Optimization and validation of a microwave imaging prototype for endoscopic explorations and interventions (MiWEndo)

Funding entity: ACC1Ó (Producte). Project ID: 2016 PROD 00048

Project budget: 99.990 €; Group funding: 99.990 €

From 3/10/2017 until 2/4/2019

Coordinator: Oscar Camara Rey (UPF)

Project title: Clinical and virtual exploration of patients for a holistic and objective description of the mechanisms involved in osteoarthritis progression (HOLOA)

Funding entity: MINECO (Retos Investigación). Project ID: DPI2016-80283-C2-1-R

Project budget: 434.390 €; Group funding: 266.200 €

From 30/12/2016 until 29/12/2019

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: CaixaImpulse MiWEndo - Real-time microwave imaging device for endoscopic explorations and interventions

Funding entity: La Caixa Foundation (CaixaImpulse)

Project budget: 94.875 €; Group funding: 94.875 €

From 1/11/2016 until 30/4/2018

Coordinator: Marta Guardiola (UPF) & Miguel A. González Ballester (ICREA-UPF)

Project title: Towards an integrated personalized approach for the early prediction of atrial fibrillation in patients at risk (PredictAF)

Funding entity: Marató TV3 Foundation. Project ID: 20154031

Project budget: 297.401,25 €; Group funding: 97.500 €

From 11/5/2016 until 10/5/2019

Coordinator: Marta Sitges (IDIBAPS) & Gemma Piella (UPF)

Project title: Development of a surgical planning and navigation system for foetal medicine and surgery

Funding entity: CELLEX Private Foundation. Project ID: CELLEX-FIRST

Project budget: 255.811 €; Group funding: 255.811 €

From 4/1/2016 until 4/1/2019

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Tecnio BCN Medtech growth plan

Funding entity: ACC1Ó (Tecnio). Project ID: TECDTP15-1-0005

Project budget: 46.500 €; Group funding: 46.500 €

From 30/10/2015 until 1/5/2017

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Real-time microwave imaging device for endoscopic explorations and interventions (MiWEndo)

Funding entity: ACC1Ó (Llavor). Project ID: 2014 LLAV 0016

Project budget: 24.000 €; Group funding: 24.000 €

From 12/6/2015 until 11/2/2016

Coordinator: Óscar Cámara Rey (UPF) & Miguel A. González Ballester (ICREA-UPF)

Project title: Towards a novel paradigm for cardiac function assessment from imaging (CardioFunXion)

Funding entity: EU (H2020 – MCSA European Industrial Doctorates). Project ID: 642676

Project budget: 1.021.497,12 €

From 1/9/2015 until 1/9/2019

Coordinator: Bart Bijnens (ICREA-UPF) & Mathieu de Craene (Philips)

Project title: Multi-object statistical models for medical imaging applications

Funding entity: AGAUR (Industrial Doctorates). Project ID: 2014 DI 034

Project budget: 55.520,00 €; Group funding: 21.600 €

From 19/3/2015 until 18/3/2018

Coordinator: Miguel A. González Ballester (ICREA-UPF) & Ludovic Humbert (Galgo Medical S.L.)

Project title: Image analysis methods for the detection of anatomical characteristics and 3D simulation of plastic surgeries

Funding entity: AGAUR (Industrial Doctorates). Project ID: 2014 DI 036

Project budget: 55.520,00 €; Group funding: 21.600 €

From 1/12/2014 until 30/11/2017

Coordinator: Miguel A. González Ballester (ICREA-UPF) & Jaime García (Crisalix Labs S.L.)

Project title: Soft tissue deformation models for planning, simulation and intra-operative navigation of endoscopic interventions

Funding entity: AGAUR (Industrial Doctorates). Project ID: 2014 DI 005

Project budget: 55.520,00 €; Group funding: 21.600 €

From 6/11/2014 until 5/11/2017

Coordinators: Miguel A. González Ballester (ICREA-UPF) & Frederic Pérez (ALMA)

Project title: New image-based computational technologies for personalised diagnosis and treatment of paediatric cancer (KIDCARE)

Funding entity: MINECO (Europa Investigación). Project ID: EUIN2013-50946

Project budget: 25.000,00 €; Group funding: 25.000€

From 1/7/2014 until 30/6/2015

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Biomechanical modelling of the femur for bone densitometry (BioDXA)

Funding entity: MINECO (Retos Colaboración). Project ID: RTC-2014-2740-1

Project budget: 291.261,60 €; Group funding: 97.825,60 €

From 1/12/2014 until 31/12/2016

Coordinators: Ludovic Humbert (Galgo Medical S.L.) & Miguel A. González Ballester (ICREA-UPF)

Project title: Deformation models for endovascular treatment and follow-up of abdominal aortic aneurysms (DEFENSE)

Funding entity: MINECO (Retos Investigación). Project ID: TIN2013-47913-C3-1-R

Project budget: 196.160,00 €; Group funding: 116.160 €

From 1/1/2014 until 31/12/2016

Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Computer model derived indices for optimal patient-specific treatment selection and planning in Heart Failure (VP2HF)

Funding entity: EU (FP7). Project ID: 611823

Project budget: 5.033.161,00 €

From 1/10/2013 until 30/9/2016

Coordinator: Reza Razavi (King's College London)

Project title: High-resolution image-based computational inner ear modelling for surgical planning of cochlear implantation (HEAR-EU)

Funding entity: EU (FP7)

Project ID: FP7-HEALTH-304857

Project budget: 4.710.781 €; Group funding: 1.324.600 €

From 1/9/2012 until 31/8/2015

Coordinator: Miguel A. González Ballester (ICREA-UPF / ALMA)

Project title: MEDIATE
Funding entity: EU (ITEA2). Project ID: ITEA2-09039
Project budget: 51.006.000 €
From 1/6/2010 until 31/12/2013
Coordinator: Herman Stegehuis (Philips Healthcare)

Project title: MEDIATE
Funding entity: MITYC (Avanza Competitividad I+D+I). Project ID: TSI-020400-2010-84
Project budget: 2.479.312,96 €
From 1/6/2010 until 31/12/2012
Coordinator: Blanca Jordán Rodríguez (ATOS)

Project title: H4H
Funding entity: EU (ITEA2). Project ID: ITEA2-09011
Project budget: 14.639.000 €
From 1/7/2010 until 28/6/2013
Coordinator: Jean-Marc Morel (Bull)

Project title: H4H
Funding entity: MITYC (Avanza Competitividad I+D+I). Project ID: TSI-020400-2010-120
Project budget: 1.321.885,98 €
From 1/7/2010 until 31/12/2012
Coordinator: Esther Carretero Carretero (REPSOL YPF)

Project title: 3DI
Funding entity: ACC1Ó (Nucli coop.). Project ID: RD10-1-0030
Project budget: 345.306,00 €
From 4/5/2010 until 3/5/2012
Coordinator: David Panyella Costa (Antonio Puig S.A.)

Project title: AMIT
Funding entity: MICINN (CENIT). Project ID: CEN-20101014
Project budget: 18.724.857 €
From 1/6/2010 until 31/12/2013
Coordinator: José María Ortega Jiménez (Sedecal)

Project title: CHIRON
Funding entity: EU (ARTEMIS). Project ID: ARTEMIS-100228
Project budget: 20.617.635,00 €
From 1/3/2010 until 28/2/2013
Coordinator: Silvio Bonfiglio (FIMI)

Project title: CHIRON
Funding entity: MITYC (ARTEMIS). Project ID: ART-010000-2010-7
Project budget: 3.850.013,00 €
From 1/3/2010 until 28/2/2013
Coordinator: Blanca Jordán Rodríguez (ATOS)

Project title: Corregistre anatòmic basat en parametritzacions per medial axes
Funding entity: AGAUR (Talent Empresa). Project ID: 2009-TEM-00007
Project budget: 47.025,00 €
From 1/2/2010 until 31/1/2013
Coordinator: Miguel A. González Ballester (ALMA)

Project title: Nou sistema intel·ligent per a processat de cultius microbiològics
Funding entity: ACC1Ó (Nucli coop.). Project ID: RD09-1-0019
Project budget: 471.691,97 €
From 1/6/2009 until 31/5/2011
Coordinator: Núria Noguera Ferrer (SENER)

Project title: CARE4ME
Funding entity: EU (ITEA2). Project ID: ITEA2-2008004
Project budget: 41.335.000 €
From 1/6/2009 until 30/9/2012
Coordinator: Frenk Sloff (Philips Healthcare)

Project title: Tecnologías informáticas avanzadas para el sector de la salud (CARE4ME - Cooperative Advanced Research for Medical Efficiency)
Funding entity: MICINN (Avanzal+D). Project ID: TSI-020400-2009-83
Project budget: 1.469.450,56 €
From 1/5/2009 until 31/12/2010
Coordinator: Miguel A. González Ballester (ALMA)

Project title: Desarrollo de un sistema estereoscópico de planificación neuroquirúrgica
Funding entity: ACC1Ó (Nucli coop.). Project ID: RD08-1-0025
Project budget: 268.281,20 €
From 9/5/2008 until 7/5/2010
Coordinator: Miguel A. González Ballester (ALMA)

Project title: Evaluación de las tecnologías de tratamiento de imágenes médicas, modelado del comportamiento tisular y simulación en la preparación de las intervenciones sobre patología traqueal.
Funding entity: Inst. Salud Carlos III (ETES). Project ID: PI07/90023
Project budget: 96.500 €
From 1/1/2008 until 31/12/2009
Coordinator: Francisco Rodríguez Panadero (Hospital Virgen del Rocío)

Project title: Prototipado rápido de prótesis traqueales personalizadas mediante desarrollo de una herramienta computacional a partir de técnicas de imagen.

Funding entity: Inst. Salud Carlos III (ETES). Project ID: PI09/90535

Project budget: 49.000 €

From 1/1/2010 until 31/12/2010

Coordinator: Francisco Rodríguez Panadero (Hospital Virgen del Rocío)

Project title: Tecnologías de tratamiento de imágenes médicas y simulación en la preparación de las intervenciones sobre patología traqueal

Funding entity: MICCINN (Torres Quevedo). Project ID: PTQ-08-1-06359

Project budget: 129.096 €

From 5/5/2008 until 30/4/2011

Coordinator: Miguel A. González Ballester (ALMA)

Project title: CDTEAM

Funding entity: MITYC (CENIT). Project ID: Cenit-CDTEAM

Project budget: 33.650.000 €

From 2/1/2006 until 31/12/2009

Coordinator: José María Ortega Jiménez (Suinsa)

Project title: MICROTRÓ

Funding entity: ACC1Ó (Nucli coop.). Project ID: RDITSCON07-1-0015

Project budget: 2.131.947,50 €

From 2/7/2007 until 30/6/2010

Coordinator: Youri A. Koubychine Merkulov (UPC)

Project title: SINBAD

Funding entity: MICINN (Proy. Singular Estratégico). Project ID: PSE-010000-2008-1

Project budget: 2.595.322 €

From 1/7/2008 until 31/12/2009

Coordinator: Ángel Rubio (CEIT)

Project title: ORTHOPLAN: Definición de criterios y diseño de sistemas on-line de clasificación, modelado y simulación para cirugía ortopédica y traumatología

Funding entity: MITYC (Avanzal+D). Project ID: TSI-020100-2009-31

Project budget: 341.982 €

From 1/4/2009 until 31/12/2009

Coordinator: Luis Blasco (Adapting S.L.)

Project title: Shape and biomechanical models for population specific design of peri-articular implants

Funding entity: CTI/KTI (Commission for Technological Innovation, Switzerland). Project ID: CTI/KTI-7961

Project budget: 1.543.000 CHF

From 1/1/2006 until 31/12/2008

Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: Joint JSPS-SNSF seminar on computer-aided surgery: present state and future technical and clinical challenges

Funding entity: SNSF (Swiss National Science Foundation). Project ID: IZ3230-115793

Project budget: 31.000 CHF

From 1/9/2007 until 30/11/2007

Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: NCCR CO-ME: Computer Aided and Image Guided Medical Interventions

Funding entity: SNSF (NCCR). Project ID: NCCR CO-ME

Project budget: 40.408.200 CHF

From 1/1/2005 until 31/12/2008

Coordinator: Gabor Székely (ETH Zürich)

Project title: Clinical applicability of computer-assisted arthroplasty using bio-engineered autografts

Funding entity: AO Foundation (Switzerland). Project ID: 05-K50

Project budget: 70.000 CHF

From 1/7/2005 until 30/6/2006

Coordinator: Nobert Südkamp (Univ. Freiburg)

Project title: Registration of CT and isocentric fluoroscopy datasets

Funding entity: AO Foundation

Project budget: 30.190 CHF

From 1/1/2005 until 31/12/2005

Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: Computer assistance for craniomaxillofacial interventions

Funding entity: AO Foundation

Project budget: 214.740 CHF

From 1/1/2005 until 31/12/2007

Coordinator: Miguel A. González Ballester (Univ. Bern)

Industrial research contracts

Project title: UBIMIND
Company: Everis
From 1/7/2018 until 30/6/2019
Project budget: 60.793 €
Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: DeepLung
Company: Eurecat
From 1/1/2018 until 31/12/2018
Project budget: 15.000 €
Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: FIS-DTS MiWEndo
Company: Fundació Clínic
From 1/7/2018 until 31/12/2019
Project budget: 47.188 €
Coordinator: Oscar Camara Rey (UPF)

Project title: Development of a surgical navigation system for epilepsy
Company: Galgo Medical
From 1/11/2017 until 31/10/2018
Project budget: 34.500 €
Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: QUAES-UPF Chair for computational technologies for healthcare
Company: Fundación QUAES
From 16/5/2017 until 15/5/2020
Project budget: 90.000 €
Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Numerical models for the prediction of fracture risk of the femur
Company: CETIR
From 1/9/2015 until 19/12/2017
Project budget: 66.700 €
Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Tibial plateau study - extension
Company: I. Carreras
From 23/2/2015 until 22/4/2015
Project budget: 7.500 €
Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: Adaptation and modification of an endoscopy navigation software
Company: Fundació Clínic
From 2/5/2014 until 4/6/2014
Project budget: 2.500 €
Coordinator: Miguel A. González Ballester (ICREA-UPF)

Project title: ERODE
Company: INDRA
From 1/11/2009 until 31/3/2011
Project budget: 210.000 €
Coordinator: Miguel A. González Ballester (ALMA)

Project title: RAPID
Company: INDRA
From 10/1/2009 until 31/12/2010
Project budget: 360.000 €
Coordinator: Miguel A. González Ballester (ALMA)

Project title: Advanced strategies for the design of orthopaedic implants and plates
Company: Stryker
From 1/10/2004 until 30/9/2005
Project budget: 184.900 CHF (approx. 150.000 €)
Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: Construction of statistical shape models for ADI CT database
Company: Brainlab
From 1/1/2005 until 31/12/2005
Project budget: 66.073 CHF (approx. 54.000 €)
Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: Ultrasound-based localization and tracking of bone structures
Company: Brainlab
From 1/4/2005 until 31/3/2008
Project budget: 237.639 CHF (approx. 195.000 €)
Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: Combined shape and intensity statistical models for fluoroscopy based bone morphing
Company: Brainlab
From 1/7/2005 until 30/6/2007
Project budget: 154.546 CHF (approx. 127.000 €)
Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: Automated CT based segmentation of 3D bone structures
Company: Brainlab

From 1/7/2005 until 30/6/2006
Project budget: 60.000 CHF (approx. 49.000 €)
Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: MR bone segmentation – state of the art
Company: Brainlab
From 1/1/2007 until 30/3/2007
Project budget: 5.000 CHF (approx. 4.000 €)
Coordinator: Miguel A. González Ballester (Univ. Bern)

Project title: Multimodal image registration
Company: Toshiba Medical Systems
From 1/10/2007 until 30/3/2008
Project budget: 15.000 CHF (approx. 12.000 €)
Coordinator: Miguel A. González Ballester (Univ. Bern)

Teaching

MSc programs and new modules

Universitat Pompeu Fabra

I have actively participated in the establishment of the biomedical engineering degree, coordinating the preparation of several new subjects (see list of subjects below). Furthermore, I participated in the design and implementation of the new MSc degree on Computational Biomedical Engineering (https://www.upf.edu/web/cbem).

University of Bern

I was a member of the core team that designed and built up the curriculum for the Master of Science in Biomedical Engineering at the University of Bern (http://www.bioeng.master.unibe.ch/). The MSc is a multi-departmental program, involving staff from clinical and technical disciplines.

The program was initially started in March 2006 with a class of 23 students coming from various fields of studies. To date, it has trained more than 300 students from more than 20 countries.

The general structure of the MSc is split into Basic Modules (44 ECTS), Major Modules (41-46 ECTS), Unrestricted Electives (0-5 ECTS) and a Master Thesis (30 ECTS). Three main courses are defined, articulated through the choice of Major Modules: Electronic Implants, Image-Guided Therapy and Musculoskeletal System.

In addition to general structuring of the program, my main focus was on the organisation of the Image-Guided Therapy module, and the preparation of the courses related to medical imaging, medical image analysis and computer vision, amongst others. I participated in the teaching of these courses from 2006 until my departure from Bern in 2008.

ETH Zürich

2006/2007 - Planning of the Medical Image Analysis course of the MSc programme, Master of Science in Biomedical Engineering, ETH Zürich (http://www.master-biomed.ethz.ch/).

Proposal of this new course, which was accepted and added to the curriculum (3 ECTS credits). I taught the course from 2007 until 2008, in collaboration with Prof. Philippe Cattin.

List of courses taught

I have taught courses at the following institutions:

Universitat Pompeu Fabra
2016-2024 Computational Therapies (MSc course, Master of Science in Computational Biomedical Engineering).
2014-2024 Planning and Guidance in Minimally-Invasive Surgery (Biomedical Engineering Degree).
2013-2024 Project Management and Innovation in Biomedical Engineering (Biomedical Engineering Degree).
2021-2023 Transversal Management of Scientific Activities (Biomedical Engineering Degree)
2020-2021 Interdisciplinary Seminars (Biomedical Engineering Degree)
2018-2019 Introduction to Biomedical Engineering (Biomedical Engineering Degree)
2013-2014 Musculoskeletal Modelling (Biomedical Engineering Degree).

2013-2014 Scientific Communication (Biomedical Engineering Degree).

ETH Zürich
2007-2008 Medical Image Analysis (MSc course, Master of Science in Biomedical Engineering, ETH Zürich, http://www.master-biomed.ethz.ch/).

University of Bern
2006-2008 Medical Image Analysis (MSc course, Master of Science in Biomedical Engineering, University of Bern, http://www.bioeng.master.unibe.ch/).

Universidad de Santiago de Chile
2004 Summer School in Medical Imaging, Universidad de Santiago de Chile, Chile (http://medical-imaging.usach.cl/).

Ecole Supérieure en Sciences Informatiques, Université de Nice – Sophia Antipolis, France
2003/2004 Introduction à la Programmation (http://www.essi.fr/epu_si/data/0607/cours/prog101/view)

Université de Nice – Sophia Antipolis, Nice, France (http://www.unice.fr)
2003/2004 Analyse d'Images Médicales (MSc Course, Diplôme d'Etudes Supérieurs Spécialisées en Génie Biomédical, http://portail.unice.fr/jahia/page1248.html)
2003/2004 Systèmes Informatiques (Diplôme d'Etudes Universitaires en Mathématiques Appliquées et Sciences Sociales, teaching assistant, http://deptinfo.unice.fr/~rr/dmass2/programmes-frame2-fr.htm#PG3).

University of Oxford, Dept. of Engineering Science (teaching assistant)
1997/1998 Design, Build and Test (MEng in Engineering, http://web.comlab.ox.ac.uk/oucl/courses/topics05-06/dbt/)
1998/1999 Design, Build and Test (MEng in Engineering).
1998/1999 Numerical Computing (MEng in Engineering and Computer Science, http://web.comlab.ox.ac.uk/oucl/courses/topics05-06/ncecs/)
1998/1999 Computer Architecture (BA in Mathematics and Computer Science, http://web.comlab.ox.ac.uk/oucl/courses/topics05-06/ca/)
1999 Tutorial on Recent Advances in Brain Morphometry, MICCAI, Cambridge, UK (http://www.cs.unc.edu/~gerig/miccai99-tutorials/prov_program.html)

Other teaching activities

PhD supervision lectures, seminars, etc.

E.g. yearly lecture at the MSc on Biomedical Engineering of the Universitat Politècnica de Valencia (2009-2013).

Supervision of theses

PhD theses (in progress)

1. Marc Balle Sánchez, “Optimizing cognitive surgical agents via multimodal vision-language-action (VLA) foundation models” (co-supervised with Dr. Albert Hernansanz), 2025-2029 (expected).
2. Enrique Franky Vargas, “Digital twins for the study of insulin resistance” (co-supervised with Dr. Raúl Herance, Vall d’Hebrón Hospital), 2025-2029 (expected).
3. Marc Molina van den Bosch, “Federated learning for medical image segmentation in heterogeneous distributed settings” (co-supervised with Dr. Luigi Serio, CERN, Switzerland), 2025-2029 (expected).
4. Francesco Aldo Venturelli, “Quantum machine learning for healthcare” (co-supervised with Dr. Alba Cervera Lierta, Barcelona Supercomputing Center), 2024-2028 (expected).
5. Khadija Hammawa, “Multi-organ insulinoresistance modelling and analysis through machine learning” (co-supervised with Dr. Raúl Herance, Vall d’Hebrón Hospital), 2024-2028 (expected).
6. Raquel González López, “Deep learning image analysis and computational simulation for the analysis of perinatal brain development” (co-supervised with Prof. Óscar Cámara), 2024-2028 (expected).
7. Karen Guldhammer Skov, “Growth trajectory modelling of children’s ear canals using geometric deep learning” (co-supervised with Prof. Rasmus Paulsen, Technical University of Denmark), 2024-2028 (expected).
8. Rafael Benito Herce, “Computer-assisted simulation for robotic spine surgery” (co-supervised with Dr. Karen López-Linares, Vicomtech and Dr. Davide Scorza, Cyber Surgery S.L.), 2023-2030 (expected).
9. Xavier Font Aragonés, “Quantum generative models for medical imaging”, 2023-2027 (expected).
10. Jorge Mateos Arriola, “Paediatric bone growth computational modelling for guided deformity correction” (co-supervised with Prof. Jérôme Noailly and Dr. Carlos Ruiz Wills), 2021-2026 (expected).
11. Meritxell Riera i Marín, “Abdominal medical image enhancement through deep learning techniques” (co-supervised with Dr. Javier García, Sycai Technologies S.L. and Dr. Adrián Galdrán, Tecnalia), 2021-2026 (expected).

PhD theses (finished)

1. Queralt Martín Saladich, “A multi-organ and multi-modal data-driven analysis of metabolic patterns in type 2 diabetes. Unravelling the pathologic mechanisms between organs: the impact of tissue-specific insulin resistance” (co-supervised with Dr. Raúl Herance, Vall d’Hebrón Hospital), 2021-2025.
2. Valentin Comte, “A deep cascaded, biomechanics-driven framework for medical image registration”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Mario Ceresa, EU Joint Research Center), 2019-2025.
3. Sai Natarajan, “High-resolution 3D modelling of lumbar spine from MRI using deep learning”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Ludovic Humbert, Galgo Medical S.L.), 2021-2024.
4. Mireia Masias Bruns, “Normalizing flows for neuroimaging research”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Gemma Piella), 2018-2024.
5. Mirza Awais Ahmad, “Single orifice and robotic solutions for fetal surgery”, PhD thesis, KU Leuven (co-supervised with Prof. Jan Deprest, KU Leuven, Prof. Emmanuel Vander Poorten, KU Leuven, Prof. Tom Vercauteren, King’s College London and Prof. Elisenda Eixarch, Universitat de Barcelona), 2019-2024.
6. Morteza Rasouligandomani, “Proximal junctional failure stratification in adult spine surgery using 3D patient-specific finite element models”, PhD thesis, Universitat Pompeu Fabra

(co-supervised with Prof. Jérôme Noailly, UPF and Dr. Fabio Galbusera, Schulthess Klinik Zürich, Switzerland), 2018-2023.

7. Enric Fernández-Velilla Ceprià, “Characteristics and uses of dual-spiral dual-energy CT in radiotherapy of the head and neck”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Manuel Algara, IMIM - Hospital del Mar, Barcelona), 2018-2023.
8. Andrea Urru. “Computational image analysis methods for the study of perinatal brain development”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Gemma Piella), 2017-2022.
9. Irem Cetin. “Interpretable machine learning through radiomics and attribute-regularized neural networks for cardiology”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Oscar Camara), 2017-2022.
10. Enric Perera Bel. “Treatment planning in electroporation-based therapies”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Antoni Ivorra), 2017-2021.
11. Laura Baumgartner. “Digging into biologically-driven injury mechanisms in the intervertebral disc - an evidence-based network modelling approach to estimate cell dynamics within complex multicellular systems”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Jérôme Noailly), 2016-2021.
12. Xavier Rafael Palou, “Detection, quantification, malignancy prediction and growth forecasting of pulmonary nodules using deep learning in follow-up CT scans”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Gemma Piella, UPF and Dr. Vicent Ribas, Eurecat), 2018-2021.
13. Alfredo Higueras Esteban. “Multimodal 3D computer planning system for the implantation of stereotactic electrodes in refractory epilepsy”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Luis Serra, Galgo Medical S.L.), 2016-2021.
14. Gabriel Bernardino Pérez. “Computational anatomy as a driver of understanding structural and functional cardiac remodelling”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Bart Bijnens, ICREA-UPF and Dr. Mathieu De Craene, Philips), 2015-2019.
15. Jordina Torrents Barrena. “Deep-learning based segmentation methods for computer assisted fetal surgery”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Mario Ceresa), 2016-2019.
16. Jordi-Ysard Puigbò Llobet. “Learning mechanisms of uncertainty and neuromodulation”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Paul Verschure, ICREA-IBEC), 2014-2019.
17. Karen López-Linares Román. “Image analysis and deep learning to support endovascular repair of abdominal aortic aneurysms”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Iván Macia, Vicomtech), 2016-2019.
18. Mirella López Picazo. “3D subject-specific shape and density modeling of the lumbar spine from 2D DXA images for osteoporosis assessment”,PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Ludovic Humbert, Galgo Medical S.L.), 2015-2019.
19. Guillermo Ruiz Fernández. “3D reconstruction for plastic surgery simulation based on statistical shape models”, PhD thesis, Universitat Pompeu Fabra (co-supervised with Dr. Federico Sukno), 2014-2018.
20. Nerea Mangado López. “Cochlear implantation modeling and functional evaluation considering uncertainty and parameter variability”. PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Gemma Piella) 2013-2017.
21. Veronika Anne Zimmer. “Image similarity for registration and manifold learning: application to brain analysis”. PhD thesis, Universitat Pompeu Fabra (co-supervised with Prof. Gemma Piella), 2013-2017.
22. Sergio Vera Hernández. "Anatomic registration based on medial axis parametrizations". PhD thesis, Universitat Autònoma de Barcelona (co-supervised with Dr. Debora Gil, Universitat Autònoma de Barcelona), 2007-2015.
23. Nina Kozic. “Statistical shape space analysis based on level sets for optimization of orthopaedic implant design”. PhD thesis, University of Bern (co-supervised with Dr. Mauricio Reyes), 2005-2009.
24. Haydar Talib. “Ultrasound-based non-invasive anatomical referencing”. PhD thesis, University of Bern (co-supervised with Prof. Martin Styner, University of North Carolina at Chapel Hill), 2004-2008.

25. Jaime García Giráldez. “Augmented reality for image guided microscope and endoscope surgery”. PhD thesis, University of Bern (co-supervised with Dr. Marco Caversaccio), 2004-2007.
26. Kumar Rajamani. “Three dimensional surface extrapolation from sparse data using deformable models”. PhD thesis, University of Bern (co-supervised with Prof. Martin Styner, University of North Carolina at Chapel Hill), 2004-2006.
27. Rudolf Sidler. “Computer assisted ankle joint arthroplasty: enabling new therapies for post-traumatic osteoarthritis and other joint diseases”. PhD thesis, University of Bern (co-supervised with Prof. Martin Styner, University of North Carolina at Chapel Hill), 2004-2006.

PhD theses (partial)

1. Benjamin Lalande, “Latent space GAN analysis for interpretable medical image analysis” (co-supervised with Dr. Mario Ceresa, UPF/JRC), 2019-2024 (*not finished*).
2. Maialen Stephens Txurio, “Interpretable deep learning generative models for the creation of virtual patient cohorts” (co-supervised with Dr. Iván Macía, Vicomtech), 2021-2023 (*not finished*).
3. Sara Noureldin. “Planning and navigation techniques for computer assisted colonoscopy” (co-supervised with Dr. Mario Ceresa) 2014-2016 (*not finished*).
4. Maurizio Bordone. “Deformation Models of Soft Tissue for Planning, Simulation, Navigation and Intra-Operative Endoscopic Interventions” 2014-2018 (*not finished*).
5. Alexis Bagué Roldán. “Multi-object statistical modelling of articulated and non-articulated anatomical structures” (co-supervised with Dr. Ludovic Humbert, Galgo Medical S.L.) 2013-2015 (*not finished*).
6. Serena Bonaretti. "Statistical FEM bone and implant modelling". PhD thesis, University of Bern (co-supervised with Dr. Philippe Büchler and Dr. Mauricio Reyes), 2007-2008(*).
7. Hyungmin Kim. “Computer assistance in craniomaxillofacial surgical interventions”. PhD thesis, University of Bern (co-supervised with Dr. Mauricio Reyes), 2007-2008(*).
8. Matthias Peterhans. “Ultrasound-based non-invasive referencing of anatomical structures for computer-assisted surgery”. PhD thesis, University of Bern (co-supervised with Prof. Stefan Webber), 2006-2008(*).
9. Ekaterina Syrkina. “Predictive Properties of Statistical Shape Models”. PhD thesis, ETH Zurich (co-supervised with Prof. Gabor Szekely, ETH Zurich), 2006-2009(*).
10. David Haberthür. “High resolution 3D lung imaging and feature detection”. PhD thesis (main supervisor: Dr. Johannes Schittny, Anatomy Dept., University of Bern), University of Bern, 2006-2008(*).
11. Laura Belenguer Querol. “Statistical FEM Bone and Implant Modelling”. PhD thesis, University of Bern (co-supervised with Prof. Daniel Rueckert, Imperial College London), 2005-2007. (*not finished*)
12. Guillaume Dugas-Phocion. “Modélisation et Segmentation des Lésions de Sclérose en Plaques en IRM Multiséquences”. PhD thesis (co-supervised with Prof. Nicholas Ayache, INRIA Sophia Antipolis, France), Ecole des Mines de Paris, 2002-2004 (*).

(*) *Co-supervision discontinued upon departure from the institution.*

MSc theses

1. Guilem Martínez Sánchez, “Semantic segmentation for memory-constrained edge devices” (co-supervised with Dr. Magí Toneu, Midokura), 2023-2024.
2. Arnau Blanco Borrego, “Fluospotter: an end-to-end pipeline for nuclei segmentation and puncta detection in fluorescence microscopy” (co-supervised with Dr. Adrián Galdrán and Dr. David Castillo, Bruker), 2023-2024.
3. Xavier Font Aragonés, “Quantum generative models for medical image analysis”, 2022-2023.
4. Blanca Sastre García, “Deep learning for pancreatic cystic lesion segmentation” (co-supervised with Meritxell Riera and Javier García, Sycai Medical S.L.), 2022-2023.

5. Lois Riobó Mayo, “Quantum machine learning for medical applications”, 2021-2022.
6. Christina Zatse, “Segmentation of neuroendocrine tumours via deep learning techniques” (co-supervised with Raúl Herance, Hospital Vall d’Hebrón), 2021-2022.
7. Queralt Martín Saladich, “Unravelling the connection between myocardial and hepatic insulin resistance in patients with type II Diabetes Mellitus”. Universitat Pompeu Fabra (co-supervised with Raúl Herance, Hospital Vall d’Hebrón), 2020-2021.
8. Enric Perera Bel, “Ultrasound to MRI fusion for vascular network reconstruction in twin-transfusion syndrome”. Universitat Pompeu Fabra (co-supervised with Dr. Mario Ceresa), 2016-2017.
9. Jaume Banús Cobo, “Validation of tDCS simulation”. Universitat Pompeu Fabra (co-supervised with Prof. Antoni Ivorra and Prof. Óscar Cámara), 2016-2017.
10. Albert Alises Sorribes, “Novel technologies for in-silico surgery: application to fetal and brain surgical planning”. Universitat Pompeu Fabra (co-supervised with Dr. Mario Ceresa), 2016-2017.
11. Jordina Torrents Barrena, “Placenta localization in intrauterine fetal MRI”. MSc thesis. Universitat Autònoma de Barcelona (co-supervised with Dr. Mario Ceresa), 2015-2016
12. Andrea Velasco Gomes, “Non-linear statistical analysis of shape models with Lie groups”. MSc thesis. Universitat Autònoma de Barcelona (co-supervised with Dr. Debora Gil), 2015-2016.
13. Christof Seiler, "Displacement vector field regularization for modelling of soft tissue deformations". MSc thesis, University of Bern (co-supervised with Dr. Mauricio Reyes), 2007-2008.

Diploma theses

1. Natalia Muñoz Moruno, “Exploring quantum generative models: A benchmark analysis”, 2023-2024.
2. Núria Blanco i Quintanilla, “Real-time environment monitoring for an artificial placenta system” (co-supervised with Mr. Marc Gàllego, Hospital Sant Joan de Déu), 2023-2024.
3. Laura Salort Benejam, “3D reconstruction of endoscopic tissues by supervised neural rendering” (co-supervised with Dr. Antonio Agudo, UPC), 2023-2024.
4. Irene Freire Barbará, “Development of a software for the extraction of omic features from radiotherapy treatment plans and application in the creation of a predictive model for 6-month progression-free survival” (co-supervised with Dr. Óscar Pera, Hospital del Mar), 2023-2024.
5. Darío Hernández Gómez, “Quantum and classical image compression: a study in breast cancer nodule detection”, 2023-2024.
6. Judith Recober Martín, “Biomechanical regularization in a deep learning fetal MRI network for registration and segmentation pipeline” (co-supervised with Valentin Comte and Gemma Piella), 2022-2023.
7. Andrés Álvarez, “Deep learning segmentation and analysis of brain structures and their relation to psychiatric disorders” (co-supervised with Benjamin Lalande), 2022-2023.
8. Laura Palacios, “Hip joint space analysis for osteoarthritis diagnosis”. Universitat Pompeu Fabra (co-supervised with Dr. Ludovic Humbert and Dr. Renaud Winzenrieth, Galgo Medical S.L.), 2020-2021.
9. Pau García, “The rise of smart hospitals: from hype to reality”. Universitat Pompeu Fabra (co-supervised with Dr. Yolima Cossio and Zaira Benítez, Hospital Vall d’Hebrón), 2019-2020.
10. Esther Motjer, “Research and testing of a technology for a quality control assessment in EVAR interventions”. Universitat Pompeu Fabra (co-supervised with Dr. George Mylonas, Imperial College London), 2017-2018.
11. Mireia Castellà, “Workflow analysis and optimisation of cardiac defibrillators in a hospital setting”. Universitat Pompeu Fabra (co-supervised with Dr. Marc Alameda, Hospital del Mar, Barcelona), 2017-2018.
12. Anna Manchón Sánchez, “Design and implementation of a support tool for surgical bloc planning”. Universitat Pompeu Fabra (co-supervised with Dr. Marc Alameda, Hospital del Mar, Barcelona), 2017-2018.

13. Laura Ros Freixedes, “Automatic scar segmentation on late gadolinium enhancement cardiovascular magnetic resonance images of patient with Tetralogy of Fallot”. Universitat Pompeu Fabra (co-supervised with Prof. Guang-Zhong Yang, Imperial College London), 2016-2017.
14. Nuria Adell Gómez, “Analysis and design proposal of an improved endoscopy unit”. Universitat Pompeu Fabra (co-supervised with Dr. Marc Alameda, Hospital del Mar, Barcelona), 2016-2017.
15. Isabel Serra Riera, “Study of equipment and ergonomics in a neurosurgical operating room”. Universitat Pompeu Fabra (co-supervised with Dr. Marc Alameda, Hospital del Mar, Barcelona), 2016-2017.
16. Adrià Font Calvarons. “Multiscale tubular features and representation”. Universitat Pompeu Fabra (co-supervised with Dr. Chong Zhang), 2015-2016.
17. María Rodríguez Cañón. “Analysis of the differences in 3D-DXA measurements at the proximal femur calculated using DXA scanners from different manufacturers”. Universitat Pompeu Fabra (co-supervised with Dr. Ludovic Humbert, Galgo Medical S.L.), 2015-2016.
18. Héctor Dejea Velardo. “Simulation study of cochlear implants stimulation protocols and its application to surgical planning”. Universitat Pompeu Fabra (co-supervised with Dr. Mario Ceresa), 2014-2015.
19. Alexandar Paravac. “Surface Quality Assessment Tools for Output Evaluation of Computer Assisted Ankle Joint Arthroplasty Using Bioengineered Autografts”. Diploma thesis, University of Applied Sciences, Olten, 2005.
20. Romain Ollivier. “Etude, Specification Technique et Mise en Place d’une Base de Données d’Images Médicales au Sein du Projet de Recherche Epidaure”. Diploma thesis, Ecole Centrale d’Electronique, Paris, 2003.

Scientific Committees and Other Merits

IEEE *Senior Member* status. Member (elected) of the IEEE Technical Committee on Bio Imaging and Signal Processing (BISP) and the IEEE Technical Committee on Biomedical Imaging and Image Processing (BIIP).

Toshiba Fellowship.

Fellowship of the Japan Society for the Promotion of Science (JSPS).

Member of ELLIS - European Laboratory for Learning and Intelligent Systems.

Member of the Computer Assisted Surgery Expert Group (CSEG) and the Comprehensive Expert Group (COEG) at the AO Foundation, Davos, Switzerland, 2005-2008.

Co-organiser (with Prof. Y. Sato, University of Osaka) of the Symposium on Computer Aided Surgery – Present State and Future Technical and Clinical Challenges, Osaka, Japan, 22-24 Sep. 2007.

Member of Program Committee of Medical Image Computing & Computer Assisted Intervention (MICCAI), Computer-Assisted Radiology and Surgery (CARS), Information Processing in Computer-Assisted Interventions (IPCAI), SPIE Medical Imaging, IEEE International Symposium on Biomedical Imaging (ISBI), Mathematical Methods in Biomedical Image Analysis (MMBIA), International Symposium on Computational Models for Biomedical Simulation (ISBMS), Congress of the European Society of Biomechanics (ESB), amongst others.

Selection of recent activities:

- **Conference President, Computer Assisted Radiology and Surgery (CARS 2024), Barcelona, Spain.**
- Associate Editor, Frontiers in Radiology - Artificial Intelligence in Radiology (since 2021).
- Program Committee, IEEE International Conference in Computer Vision (ICCV 2021), CVAMD Workshop.
- Area Chair, MICCAI 2020, Lima, Peru.
- Associate Editor, IEEE Engineering in Medicine and Biology (EMBC 2020, 2021, 2022, 2023).
- **Program Chair, International Symposium on Biomedical Imaging (ISBI 2019), Venice, Italy.**
- Program Committee, IEEE International Conference in Computer Vision (ICCV 2019), VRMI Workshop.
- Theme co-Chair, “Biomedical imaging and image processing”, and Special session organizer, “Machine learning and deep learning for medical image analysis”, IEEE Engineering in Medicine and Biology (EMBC 2018), Honolulu, USA.
- Organizing Committee, Computer Assisted Radiology and Surgery (CARS 2018), Berlin, Germany.
- Special session organizer, “Modelling uncertainty and propagation of data for biomechanics systems”, World Congress of Biomechanics (WCB 2018), Dublin, Ireland.
- Special session organizer, “Imaging for developing countries”, IEEE International Symposium on Biomedical Imaging (ISBI 2018), Washington DC, USA.
- Tutorials co-Chair, Medical Image Computing and Computer Assisted Interventions (MICCAI 2018), Granada, Spain.
- Area chair, IEEE International Conference on Image Processing (ICIP 2017), Beijing, China
- Program Committee member, Computer Assisted Radiology and Surgery, CARS 2017 (Barcelona, Spain)
- Area chair, Information Processing in Computer-Assisted Interventions (IPCAI 2017), Barcelona, Spain
- Program Committee member, ACM Symposium on Applied Computing - Advances in Computational Biomedical Imaging (SAC-COMBI 2017), Marrakesh, Morocco
- Program Committee member, SPIE Medical Imaging 2017, Orlando, USA
- Workshop co-chair, MICCAI-CLIP 2016 (Athens, Greece)

- Program Committee member, Medical Image Computing and Computer-Assisted Interventions (MICCAI 2016), Athens, Greece
- Program Committee member, Computer Assisted Radiology and Surgery, CARS 2016 (Heidelberg, Germany)
- Program Committee member, SPIE Medical Imaging 2016, San Diego, USA
- Workshop co-chair, MICCAI-CLIP 2015 (Munich, Germany)
- Local co-organiser, Computer Assisted Radiology and Surgery, CARS 2015 (Barcelona, Spain)
- Area chair, Information Processing in Computer-Assisted Interventions (IPCAI 2015), Barcelona, Spain
- Program Committee member, Computer Assisted Radiology and Surgery, CARS 2015 (Barcelona, Spain)
- Area chair, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2015), Melbourne, Australia
- Workshop co-chair, MICCAI-CLIP 2014 (Boston, USA)
- Program Committee member, Medical Image Computing and Computer-Assisted Interventions (MICCAI 2014), Boston, USA
- Workshop co-chair, MICCAI-CLIP 2013 (Nagoya, Japan)

Reviewer for journals, such as: Medical Image Analysis (Elsevier), Transactions on Medical Imaging (IEEE), NeuroImage (Elsevier), Computer Aided Surgery (Taylor & Francis), Computer Vision and Image Understanding (Academic Press), Journal of Neuroscience Methods (Elsevier), The Visual Computer (Springer), Computer Methods and Programs in Biomedicine (Springer), and Transactions on Information Technology in Biomedicine (IEEE), amongst others..

Reviewer for conferences: IEEE Engineering in Medicine and Biology (EMBC), Medical Image Computing & Computer Assisted Intervention (MICCAI), Virtual Environment Interactions and Physical Simulation (VRYPHIS), Computer Vision and Pattern Recognition (CVPR) and IEEE International Symposium on Biomedical Imaging (ISBI), IEEE International Joint Conference on Neural Networks (IJCNN), amongst many others.

Evaluator of grant proposals / on-going projects for: European Commission (7^{th} Framework Program, Horizon 2020 and Horizon Europe), Swiss National Science Foundation (SNSF), Natural Sciences and Engineering Research Council of Canada (NSERC), Agence Nationale de la Recherche (France) and Rhône-Alpes Region (France).

PhD thesis evaluator at, e.g University of Oxford (UK), ETH Zurich (Switzerland), INRIA (France), Universidad de Las Palmas de Gran Canaria (Spain), Heriot-Watt University (UK), EPFL (Switzerland), Universidad de Valladolid (Spain), Universidad de Barcelona (Spain), Technical University of Denmark, Universidad Politécnica de Madrid (Spain), Universidad Politécnica de Valencia (Spain), Universitat Politècnica de Catalunya (Spain), Telecom Bretagne (France), Universidad del Pais Vasco (Spain), Politecnico di Milano (Italy), etc. MSc thesis evaluator at the University of Cape Town (South Africa).

Languages

Spanish	Mother tongue
Catalan	Mother tongue
English	Expert
French	Expert
Japanese	Advanced