## XAVIER BELTRAN URBANO

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#### **EDUCATION**

#### University of Pennsylvania

Bioengineering PhD student

Aug. 2024 - Present

<u>Current Research:</u> Developing AI applications in neuroimaging, focused on Alzheimer's disease and related dementias. Ongoing projects include generative models and AI-based quality control methods.

#### University of Girona, University of Burgundy, University of Cassino

MSc Student in Erasmus Mundus Joint Master Degree in Medical Imaging and Applications (MAIA)

Sept. 2022 - June 2024

**Relevant Courses:** Machine and Deep Learning and Advanced Image Analysis

#### University of Girona

BEng in Biomedical Engineering

Sept. 2018 - June. 2022

Relevant Courses: Image Analysis and Processing and Neuroscience and Neuroimaging

#### RESEARCH EXPERIENCE

### Detrelab at University of Pennsylvania, Research Engineer Intern

Jan. 2024 – August. 2024

- Analyzed Arterial Spin Labeled (ASL) perfusion magnetic resonance imaging (MRI) as a non-invasive method for imaging regional CBF.
- Developed a deep learning approach to automate ASL CBF quality assessment, enabling more reliable perfusion imaging in clinical and research workflows.

#### **R&D Department of icometrix,** Research Engineer Intern

July 2023 - Oct. 2023

- Analyzed stroke brain imaging data using CT perfusion maps from a multicenter dataset.
- Developed an innovative deep learning-based post-processing approach (Accuracy: 93%) to remove stroke CT perfusion maps's artifacts.

## ViCOROB Group of Research, Biomedical Engineer Intern

Jan. 2022 - June 2022

- Utilized both unsupervised algorithms and Convolutional Neural Networks (CNN) to perform brain tumor segmentation (Accuracy: 83%) from MRI data.
- Successfully created a 3D model representing the patient's skull and tumor to enhance the preoperatives for brain surgery.

### ViCOROB Group of Research, Biomedical Engineer Intern

June 2021 – Sept. 2021

- Engaged in various machine learning and deep learning projects with a primary focus on computer vision and medical imaging.
- Successfully developed a melanoma detector through the application of a range of machine learning algorithms (Accuracy: 72%).

## PUBLICATIONS AND TECHNICAL POSTERS

- **X.B.** Urbano, K.R. Jobson, S. Li, M. Taso, I.M. Nasrallah, L. Xie, D.A. Wolk, S. Dolui, J.A. Detre, for the Alzheimer's Disease Neuroimaging Initiative, "SynthPET: A 3D Generative AI approach for FDG-PET image synthesis from MRI and ASL data" (Manuscript being prepared)
- X.B. Urbano, M. Taso, I.M. Nasrallah, Z. Wang, J.A. Detre, S. Dolui, "QEI-Net: A Deep learning-based automated quality evaluation index for ASL CBF Maps" (Accepted as power-pitch presentation in the ISMRM 2025 Conference in Honolulu, Hawaii) [link]
- X.B. Urbano, M. Taso, I.M. Nasrallah, Z. Wang, J.A. Detre, S. Dolui, "QEI-Net: A Deep learning-based automated quality evaluation index for ASL CBF Maps" (Accepted as an oral presentation the ISMRM Workshop on Perfusion MRI) [link]
- X.B. Urbano, A.D.Permana, "Edge Detection In Medical Ultrasound Images Using Adjusted Canny Edge Detection Algorithm." [link]
- A.D.Permana, X.B. Urbano, "An Adaptive ECG Noise Removal Process Based on Empirical Mode Decomposition (EMD)." [link]
- *Bachelor thesis*, "NeuroPrint: Revolutionizing Neurosurgical Planning with AI-Driven 3D Brain Mapping", By **X.B.Urbano**, Department of computer vision and robotics (VICOROB), University of Girona, June 2022. [link to the summary]

#### PROJECTS DEVELOPED

- A Hybrid Approach for Brain Tissue Segmentation: Integrating Gaussian Mixture Models with Atlas-based and Tissue Modeling Techniques | Python
- Brain Tissue Segmentation using Expectation Maximization (EM) algorithm for Gaussian Mixture Models (GMM) | Python
- Mammogram Mass Detection and Classification | Python, Scikit-Learn and OpenCV
- Alzheimer's Disease Classification with MRI and Gene Expression Data | Python and R

## LEADERSHIP EXPERIENCE

## Student representative of the seventh cohort of MAIA students, Delegate

Sept. 2023 - June 2024

 Interacted as an intermediary between students and program administrators, advocating for the interests of their cohort and facilitating communication and programme enhancements.

# Biomedical engineering mentoring program, Mentor

Sept. 2019 - June 2021

• Assisted first-year bachelor students in academic and non-academic related.

#### AWARDS AND RECOGNITIONS

• The Peer Choice Award by the Penn Nursing Smarter Care Datathon (selected by participants as Best Project)

•	The ISMRM Summa Cum Laude Merit Award (Top 5% of accepted abstracts)	2025
•	Finalist in the MAIA Alzheimer's Classification Challenge by the Italian National Research Council & University of Cassino	2023
•	Twice awarded with the prestigious INTHERAPI Graduate School Scholarship by the University of Bourgogne	2022, 2023
•	Erasmus Mundus Joint Master Consortium Grant by the University of Girona	2022
PROFESSIONAL DEVELOPMENT AND CERTIFICATIONS		
•	Course in Fundamental Neuroscience for Neuroimaging by Johns Hopkins University, Coursera	2023
•	Course in AI for Medical Diagnosis by DeepLearning.AI, Coursera	2023
•	Immersion course in English specialized in Health and Life Science by UIMP	2022

# TECHNICAL/LANGUAGE SKILLS

<u>Languages</u>: English (Speak, Read, Write), Spanish (Native speaker), Catalan (Native speaker)

<u>Programming/Scripting Languages</u>: Python (Pytorch and Tensorflow), Java, R, MATLAB, HTML, LaTeX, Arduino, LabVIEW, SQL

<u>Software Packages</u>: Qt Designer, 3DSlicer, RStudio, SPM12, FSL, ITK-SNAP, Photoshop, Microsoft Office, UltiMaker Cura