

## Internship in 3D ultrasound multiparametric segmentation

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<b>Position</b>	Internship
<b>Duration</b>	4-6 months
<b>Start date</b>	Jan 2024
<b>Project Context</b>	<p>This internship is part of a project aiming to apply multiparametric ultrasound imaging to precisely characterizing tumors for breast cancer diagnosis. 3D maps of tissue stiffness, vascularization and tissue fiber structure will be used to infer tumor characteristics such as stage and grade. This requires precise localisation of the tumor boundaries, which will not be possible on standard Bmode ultrasound imaging.</p> <p>This internship focuses on the development of an automated segmentation technique using the different registered quantitative 3D maps to delineate the tumor. This will be done using existing data obtained from ex-vivo breast tumor samples for which radiologist delineation is already available as a gold standard. The intern will be responsible for designing an efficient and automated segmentation algorithm using techniques ranging in complexity from gradient-based deformable contours to deep learning.</p> <p>She/He will evolve in a highly dynamic scientific environment, within a multidisciplinary team composed of physicists, engineers and medical doctors.</p>
<b>Missions</b>	<ul style="list-style-type: none"> <li>• Analysis of the literature and state of art in the field</li> <li>• Database preparation</li> <li>• Designing of algorithms</li> <li>• Validation and selection of the best algorithm</li> <li>• Reporting of results and preparation of a scientific article</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Image/signal processing</li> <li>• Programming (Matlab, Python, R)</li> <li>• 3D imaging</li> <li>• Segmentation techniques/deep learning</li> </ul>
<b>Skills</b>	<ul style="list-style-type: none"> <li>• Ability to work in a multidisciplinary team</li> <li>• Proficiency in English</li> <li>• Drive and initiative</li> <li>• Rigor and precision</li> </ul>
<b>Degree</b>	M1/M2 student in acoustics, biomedical engineering or physics
<b>Salary</b>	4.35 euros/h (net) + 50% of transport covered