

# ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

## DET - Microwave imaging and sensing technology for neurodegenerative diseases diagnosis

<b>Funded By</b>	Dipartimento DET
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<b>Context of the research activity</b>	The goal of this PhD activity is to provide the proof-of-concept of a microwave imaging and sensing system to diagnose neurodegenerative diseases such as the Alzheimer's disease (AD).
<b>Objectives</b>	<p>AD is a progressive neurodegenerative disease, where dementia symptoms gradually worsen over the years.</p> <p>Currently, AD diagnosis is based on the measure of deposition of proteins in cerebrospinal fluid (CSF) samples extracted by performing a lumbar puncture. Since this method is highly invasive and may lead to adverse effects, there is a high interest in finding novel non-invasive and low-cost techniques to appraise diagnostic biomarkers to identify AD as early as possible.</p> <p>The enabling factor of microwave imaging and sensing technology resides in the nature of microwaves to sense the different electromagnetic properties of tissues. Hence, this activity will investigate the capability of microwaves of sensing the diagnostic AD biomarkers non-invasively in CSF. The proposed technology will exploit low-cost and low form-factor components being therefore viable for large scale screening and broadly accessible treatments.</p>
<b>Skills and competencies for the development of the activity</b>	<ul style="list-style-type: none"><li>- Knowledge of microwaves and antennas</li><li>- Capabilities in using electromagnetic modelling softwares</li><li>- Knowledge of programming</li></ul>