

# BIOENGINEERING AND MEDICAL-SURGICAL SCIENCES

## UNITO - Digital design in orthodontics

<b>Funded By</b>	UNIVERSITA' DEGLI STUDI DI TORINO [P.iva/CF:02099550010]
<b>Supervisor</b>	DEREGIBUS ANDREA PIERO - andrea.deregibus@polito.it
<b>Contact</b>	
<b>Context of the research activity</b>	<p>The research aims to analyse the predictability and reliability of digitally designed devices made with 3D printing methods. This analysis will focus on the deepening of the digital design processes currently available in orthodontic design software, also focusing on the production processes concerning 3D printing techniques using stereolithography. This is because we intend to evaluate what is the result of this design and production process, examining its reproducibility and production precision; these characteristics presuppose the clinical reliability of the designed device, which will then be examined in the course of the research.</p>
<b>Objectives</b>	<p>The research arises in the context of new digital techniques and methodologies that support modern orthodontics both as regards the design of new devices to predict the desired clinical results and as regards the production process that leads to the realization of such devices.</p> <p>To date, it is in fact possible, through specific orthodontic design software, both to predict what will be the desired clinical result, and to digitally design the orthodontic device of clinical interest. Currently the dedicated software existing on the market allows you to design these devices in a pre-established and non-modifiable way, so it is also possible to use generic 3D sculpting software, so is possible to make the desired changes to the device according to what are the clinical preferences already in digital format, at the beginning of the design.</p> <p>The designed devices can be made with common 3D printing techniques and, at the end of the production process, it is also possible to perform a whole series of digital comparisons also reverse engineering that allow you to understand how much the device made reflects the original digital project.</p>
<b>Skills and competencies for the development of the activity</b>	<p>The candidate is an expert in the digital design of auxiliary devices to the maneuvers of clinical interest in orthodontics as well as in the digital design of real orthodontic devices, being able to master both purely orthodontic design software and generic digital modelling software. The candidate masters the stereolithography 3D printing technique and is capable in the use of reverse engineering software for the post-production analysis of the precision and accuracy of the devices made.</p>

