Clinical studies provide a significant amount of data to surgeons. For orthognathic patients, the final outcome is important for functional and aesthetic reasons. Therefore, it is important to make a proper preoperative surgical planning. The experience of the surgeon plays an important role. For inexperienced surgeons, the extensive amount of data may result in suboptimal decision-making. This research proposes the use of machine learning to aid surgeons in this process.

Multiple algorithms were tested in MATLAB and implemented in Python. The final algorithms consist of 2 SVM implementations for discrete values (surgery type) and 6 neural networks with linear output activation for analog values (surgical movement). The input features consist of the 20 best correlated features from the clinical studies. The dataset included 320 patients, of which 64% were used for training, 20% for testing and 16% for cross-validation. These 320 patients include patients undergoing every type of surgery. The Python script was later integrated to be used in conjunction with a web interface.

The classification algorithms show promising results for both F1-score and Ratio of Correctly Classified Examples (RCCE). Results could be improved by increasing the amount of training examples for each category.