# Development of a Force-Sensing Toothbrush for Gum Recession Measurement Using Programmable Automation Controller

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**Abstract :** This paper presents the design and implementation of a novel electric pressure-sensitive toothbrush, capable of measuring the forces applied to the head of the brush. The developed device is used for gum recession measurement. In particular, the percentage of gum recession is measured by a Programmable Automation controller (PAC). Moreover, the brushing forces are measured by a Force Sensing Resistor (FSR) sensor. These forces are analog inputs of PAC. According to the applied forces during patient's brushing and the patient's percentage of gum recession, dentist sets the standard force range. The instrument alarms when the patient applies a force over the set range.