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ABSTRACT

Robotic Arm for Dental Automation

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The intervention of robotics in the field of dentistry can offer improved and precise treatment with good quality of work in a less amount of time. It can alter the dental health of the people making it much safer.

The system will be developed consisting of a preoperative and an intra operative stage.

1. In the preoperative stage, software is used to choose and create medical history files for the patient, and it can monitor the pulse rate and oxygen saturation via finger pulse oximetry. This information will help clinicians monitor the condition of patient during procedures. Followed by taking a cone beam CT image to the patient and a dental x-ray image to the area of chief complaint, software can estimate the maximum carpule of dental anesthesia according to the patient's age, weight and medical history.
2. The intra operative stage displays the 3D virtual dentitions on the screen with initial interpretation of the image. The diagnosis is made by the clinician with sensory feedback and information processing gathered from the preoperative stage. The diagnodent pen and chemical dyes are used to confirm the diagnosis of the susceptible lesion, using a system which can move in the 6-axis of each tooth for its position along X, Y, Z, lingual, rotation, near-far medium direction. It is used in order to check the position of the patient and the movement of the surgical instruments by intra-oral camera and reference point, which is established by the clinician in the beginning of the procedure. The clinician will finally completely remove the decay or preparation of the tooth with compliance using a minimally invasive concept during the entire procedure.