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Computerised toothbrush makes oral hygiene a game

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Colin Barras

Here's a novel way to encourage young children to brush up on their oral hygiene – turn a toothbrush into a simple version of a Nintendo Wii remote and turn a chore into a fun computer game.

Parents or professionals trying to teach young children to brush their teeth are faced with two problems. Many youngsters are unwilling to brush their teeth in the first place. Then, even if they can be persuaded, they often lack the skill to brush them effectively – for example, the average five-year old brushes only a quarter of their teeth.

Hao-hua Chu and his team at the National Taiwan University have come up with a novel solution using a "learning through play" approach.

To the end of a normal toothbrush they added a simple box-shaped extension with a unique pattern of three LEDs on each face. These LEDs that can be tracked using computer vision technology.

Webcam tracking

A webcam mounted on the wall above the bathroom sink can then track brush movements in three dimensions and feed this information into a computer. The computer distinguishes the orientation of the brush, and can also track its x-axis "roll" and z-axis "yaw".

This information can be used to determine the position of the toothbrush head and to work out precisely which teeth the bristles are in contact with at any given moment.

"We initially tried using motion sensors – 3D accelerometers – similar to the ones in the Wii remote," says Chu. "But we were only able to accurately detect four rough teeth areas: upper-lower, and left-right."



A new computer game guides children as they brush their teeth.

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