**Name:** Adam Stegall

**Grad/Undergrad status:** Undergrad

**Phone number:** 828.231.5191

**Email:** Astegal4@uncc.edu

**ITCS-4152-001 Project Proposal**

Tooth decay is the most widespread disease in the United States, prevalent in 37% of children, 58% of adolescents, and 90% of adults (Heng, 2016.) The earlier tooth decay is detected, the more conservatively it can be treated. Bitewing X-rays are commonly used to detect tooth decay, which shows up as a dark area in the digital file. The dentist visually assesses the x-ray to determine if tooth decay is present.

I propose a computer vision program that identifies tooth decay in digital dental X-rays. If implemented well, such a system could be of great use and benefit to dental healthcare workers and their patients. Approximately 80% of dentists in the United States own private practices (Manchir, 2017), and visual assessment of the X-rays is performed by the dentist. A computer vision program may be very useful in accelerating the process of analyzing them, giving the dentist more time to focus on their patients.

The primary goal for such a system would be to provide rapid and accurate identification of possible tooth decay areas. This process and result could be incorporated into a software product that could be marketed to dental healthcare providers as a digital assistant. Downstream benefits would be to streamline workflow by providing accelerated analysis, to reduce the probabilities of human error, and to even recommend possible treatment options.

In shallow research of this topic, it seems that there has been relatively little exploration of it, and that there are ample academic and business opportunities available. If within the scope of the project, it would also be interesting to explore the use of DeepFakes in dental images. With this application, a patient’s existing X-ray could be modified to show what their teeth would look like if tooth decay progressed, or after a proposed treatment. This could be useful to the dentist in providing personalized care to their patient, and the knowledge derived in creating such a system may have applications beyond dental X-rays as well.

This computer vision system for identifying tooth decay would be presented in a final technology demonstration using a video recording. PowerPoint and a Jupyter Notebook would be very useful for presentation and documentation of the project, for student portfolios, and in development and implementation of a potential software product.

**Works Cited**

Heng, C. (2016, October). Tooth Decay Is the Most Prevalent Disease. Retrieved September 25, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6373711/

Manchir, M. (2017, August 30). Practice ownership declining among dentists. Retrieved September 25, 2020, from https://www.ada.org/en/publications/ada-news/2017-archive/august/practice-ownership-declining-among-dentists