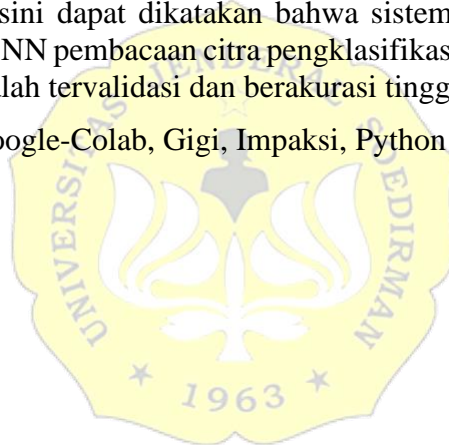


ABSTRAK

Penelitian tugas akhir ini bertujuan merancang sebuah sistem algoritma pembacaan citra untuk pengklasifikasian kasus impaksi gigi. Metode rancangannya diawali dari augmentasi tiap citra panoramik sinar-X gigi menjadi potongan-potongan citra berukuran serba sama, yaitu 100 x 100 piksel. Citra-citra ini dikelompokkan dan dilabel sebagai RI (*Right Impaction* / Impaksi Kanan), RNI (*Right Non Impaction* / Bukan Impaksi Kanan), LI (*Left Impaction* / Impaksi Kiri) dan LNI (*Left Non Impaction* / Bukan Impaksi Kiri). Arsitektur jaringan syaraf tiruan *Convolutional Neural Network* (CNN) berbasis bahasa pemrograman Python yang tertanam dalam Google Colab dimanfaatkan untuk melakukan pelatihan dan validasi kelompok dataset citra augmentasi. Keandalan algoritma di tahapan pelatihan ini adalah dihasilkannya waktu total perhitungan komputasi, yaitu selama 13 menit, 3 detik. Validasi pembacaan dataset augmentasi diyakinkan dari *trend data plotting loss* yang mendekati 0 dan *accuracy* yang mendekati 1. Evaluasi berupa pengujian algoritma hasil pelatihan dan validasi dilakukan dengan pembacaan 10% dari total dataset augmentasi. Dengan perhitungan, didapat nilai akurasi atau AC sebesar 99,41%. Dari sini dapat dikatakan bahwa sistem algoritma berarsitektur jaringan syaraf tiruan CNN pembacaan citra pengklasifikasian keadaan impaksi dan bukan impaksi gigi adalah tervalidasi dan berakurasi tinggi.

Kata kunci : CNN, Google-Colab, Gigi, Impaksi, Python



ABSTRACT

This final project aims to design an image reading algorithm system for the classification of tooth impaction cases. The design method begins with the augmentation of each dental x-ray panoramic image into equal-sized pieces of 100 x 100 pixels. These images are grouped and labeled as RI (Right Impaction), RNI (Right Non Impaction), LI (Left Impaction) and LNI (Left Non Impaction). The Python programming language-based Convolutional Neural Network (CNN) artificial neural network architecture embedded in Google Colab was utilized to perform training and validation of the augmented image dataset groups. The reliability of the algorithm in this training stage is the result of the total computation time, which is 13 minutes, 3 seconds. The validation of the augmentation dataset readings is assured from the trend of the plotting loss data which is close to 0 and the accuracy which is close to 1. Evaluation in the form of testing the training and validation results of the algorithm was carried out by reading 10% of the total augmentation dataset. By calculation, the AC accuracy value of 99.41% was obtained. Hence, it can be said that the CNN artificial neural network architecture algorithm system for image reading process to classify impaction and non-impaction states of teeth is validated and indeed has high accuracy.

Keywords : CNN, Google-Colab, Impaction, Python, Tooth

