

KLASIFIKASI POSE YOGA *SURYA NAMASKAR* MENGGUNAKAN METODE *DEEP LEARNING*

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ABSTRAK

Penelitian ini bertujuan untuk membangun dan membandingkan kinerja model klasifikasi pose yoga *Surya Namaskar* menggunakan metode *Deep Learning* dengan arsitektur *Convolutional Neural Network* (CNN) VGG19 dan ResNet-50. *Surya Namaskar* merupakan rangkaian pose yoga yang populer, namun kesalahan postur tanpa pengawasan instruktur dapat berisiko cedera. Dataset yang digunakan terdiri dari 154 citra asli yang diaugmentasi menjadi 1.540 citra, terbagi dalam 7 kelas pose: *Pranamasana*, *Hasta Utthanasana*, *Padahastasana*, *Ashwa Sanchalanasana*, *Parvatasana*, *Ashtanga Namaskara*, dan *Bhujangasana*. Proses pelatihan dilakukan menggunakan *optimizer* Adam dengan variasi *learning rate* 0.0001, 0.00001, dan 0.00005. Hasil penelitian menunjukkan bahwa arsitektur ResNet-50 secara konsisten mengungguli VGG19. Kinerja terbaik dicapai oleh ResNet-50 pada *learning rate* 0.00005 dengan akurasi 85%, sedangkan akurasi terbaik VGG19 hanya mencapai 77% pada *learning rate* 0.0001. Penelitian menyimpulkan bahwa arsitektur ResNet-50 dengan *residual connection* lebih efektif dalam mengklasifikasikan pose yoga yang kompleks dibandingkan VGG19, meskipun masih terdapat tantangan dalam membedakan pose dengan kemiripan visual tinggi seperti *Ashwa Sanchalanasana* dan *Bhujangasana*.

Kata kunci: *Deep Learning*, CNN, VGG19, ResNet-50, Yoga *Surya Namaskar*

CLASSIFICATION *SURYA NAMASKAR* YOGA POSES USING THE *DEEP LEARNING* METHOD

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ABSTRACT

This study aims to develop and compare the performance of Surya Namaskar yoga pose classification models using Deep Learning methods with Convolutional Neural Network (CNN) architectures VGG19 and ResNet-50. Surya Namaskar is a popular yoga sequence, but posture errors without instructor supervision can pose a risk of injury. The dataset used consists of 154 original images augmented into 1,540 images, divided into 7 pose classes: *Pranamasana*, *Hasta Utthanasana*, *Padahasthasana*, *Ashwa Sanchalanasana*, *Parvatasana*, *Ashtanga Namaskara*, and *Bhujangasana*. The training process was carried out using the Adam optimizer with learning rate variations of 0.0001, 0.00001, and 0.00005. The results showed that the ResNet-50 architecture consistently outperformed VGG19. The best performance was achieved by ResNet-50 at a learning rate of 0.00005 with an accuracy of 85%, while the best accuracy of VGG19 only reached 77% at a learning rate of 0.0001. The study concludes that the ResNet-50 architecture with residual connections is more effective in classifying complex yoga poses compared to VGG19, although challenges remain in distinguishing poses with high visual similarity such as *Ashwa Sanchalanasana* and *Bhujangasana*.

Keywords: *Deep Learning, CNN, VGG19, ResNet-50, Surya Namaskar Yoga*