

ABSTRAK

Skripsi ini bertujuan untuk mengimplementasikan teknik Background Subtraction dan Connected Component Labeling dalam memprediksi jumlah benih ikan lele pada suatu akuarium. Metode Background Subtraction digunakan untuk menghilangkan latar belakang pada citra, sementara Connected Component Labeling digunakan untuk mengidentifikasi dan menghitung jumlah benih ikan lele yang terdeteksi. Penelitian ini melibatkan pengambilan citra digital dari akuarium menggunakan kamera dan penerapan teknik pra-pemrosesan untuk menghilangkan latar belakang dan meningkatkan kualitas citra digital. Selanjutnya, dengan menerapkan metode Connected Component Labeling, jumlah benih ikan lele yang terdeteksi akan dihitung dan diprediksi.

Hasil pengujian menunjukkan bahwa akurasi deteksi jumlah benih ikan lele dengan menggunakan teknik Connected Component Labeling (CCL) bervariasi tergantung pada jumlah benih ikan lele yang ada. Untuk jumlah benih lele kurang dari atau sama dengan 10, diperoleh akurasi rata-rata 100%. Namun, pada jumlah benih ikan lele sebanyak 25, akurasi rata-rata berada di bawah 76%. Sedangkan pada jumlah benih ikan lele sebanyak 50, akurasi rata-rata berkisar antara 46% - 50%. Penelitian ini memberikan kontribusi dalam pengembangan sistem pemantauan dan manajemen populasi ikan lele di akuarium. Meskipun terdapat variasi akurasi deteksi tergantung pada jumlah benih ikan lele, implementasi teknik Background Subtraction dan Connected Component Labeling membuka peluang untuk meningkatkan akurasi prediksi jumlah benih ikan lele secara lebih lanjut melalui peningkatan metode dan teknik yang digunakan.

Kata Kunci : Ikan lele, Pengolahan Citra Digital, *Background Subtraction*, *Connected Component Labeling*

ABSTRACT

This thesis aims to implement Background Subtraction and Connected Component Labeling techniques in predicting the number of seeds in an aquarium. The Background Subtraction method is used to remove the background on the image, while Connected Component Labeling is used for identifying and calculating the number of lele seeds detected. The research involved taking digital images from aquariums using cameras and applying pre-processing techniques to remove backgrounds and improve the quality of digital images. Next, by applying the Connected Component Labeling method, the number of seeds detected will be calculated and predicted.

The test results showed that the accuracy of detection of the number of seeds by using the Connected Component Labeling (CCL) technique varied depending on the amount of seed available. For the number of lily seeds less than or equal to 10, an average accuracy of 100% is obtained. However, on the number of lily seeds of 25, the average accuracy was below 76%. As for the number of seeds of lele fish of 50, the average accuracy ranges between 46% - 50%. This research has contributed to the development of monitoring and management systems for fish populations in aquariums. Although there are variations in detection accuracy depending on the number of seeds, the implementation of Background Subtraction and Connected Component Labeling techniques opens up opportunities to further improve the prediction of seed numbers by improving the methods and techniques used.

Keywords: *Catfish , Digital Image Processing, Background Subtraction, Connected Component Labeling*