

ABSTRAK

Logo merupakan elemen visual yang sangat penting dalam membangun identitas dan citra sebuah brand fashion. Di era digital saat ini, penyebaran gambar logo semakin masif, sehingga rawan terjadinya plagiarisme atau penggunaan tanpa izin. Oleh karena itu, dibutuhkan suatu sistem yang mampu mengidentifikasi kemiripan gambar logo secara otomatis. Penelitian ini mengangkat permasalahan bagaimana cara mendeteksi kemiripan gambar logo brand fashion secara efektif, dengan mengoptimalkan metode image hashing. Fokus utama dari penelitian ini adalah membandingkan dan sekaligus menggabungkan tiga metode image hashing populer, yaitu average hash (aHash), perceptual hash (pHash), dan difference hash (dHash), guna meningkatkan akurasi identifikasi kemiripan logo.

Penelitian ini menggunakan pendekatan eksperimen berbasis pengolahan citra digital. Dataset disusun secara mandiri oleh peneliti dengan mengumpulkan gambar logo brand fashion dari berbagai situs e-commerce. Tahapan yang dilakukan meliputi pra-pemrosesan gambar (grayscale dan resize), ekstraksi hash menggunakan ketiga metode (aHash, pHash, dHash), dan perhitungan jarak Hamming antar hash untuk menentukan tingkat kemiripan. Selain dilakukan pengujian secara individual terhadap masing-masing metode hashing, penelitian ini juga merancang pendekatan gabungan (hybrid) dari ketiga metode tersebut untuk memperoleh hasil klasifikasi kemiripan yang lebih stabil. Sistem dikembangkan menggunakan bahasa pemrograman Python dengan pustaka OpenCV, NumPy, dan antarmuka web sederhana.

Berdasarkan hasil penelitian terhadap metode aHash, pHash, dHash, dan pendekatan gabungan, disimpulkan bahwa meskipun masing-masing metode memiliki keunggulan dan kelemahan—di mana aHash unggul dalam sensitivitas namun lemah dalam akurasi, pHash sangat akurat namun kurang sensitif, dan dHash memiliki performa terendah—pendekatan gabungan menunjukkan performa paling seimbang (precision 75%, recall 50%, F1-score 60%), sehingga layak dijadikan dasar awal sistem deteksi kemiripan logo dengan potensi peningkatan melalui optimalisasi preprocessing, penyesuaian threshold, atau integrasi dengan metode lain seperti deep learning.

Kata Kunci: Image hashing, kemiripan gambar, logo brand fashion, gabungan metode, hamming distance

ABSTRACT

Logos play a vital role in establishing the identity and image of a fashion brand. In today's digital era, the widespread distribution of logo images increases the risk of plagiarism or unauthorized use. Therefore, a system capable of automatically identifying logo image similarity is essential. This research addresses the problem of detecting the similarity of fashion brand logos effectively by optimizing the image hashing approach. The main objective of this study is to compare and combine three popular image hashing methods—average hash (aHash), perceptual hash(pHash), and difference hash (dHash)—in order to improve the accuracy of logo similarity identification.

This study adopts an experimental approach based on digital image processing. The dataset was compiled manually by collecting fashion brand logo images from various e-commerce platforms. The research stages include image preprocessing (grayscale conversion and resizing), hash extraction using the three methods (aHash, pHash, dHash), and Hamming distance computation to measure similarity. In addition to individual testing of each hashing method, this study also proposes a hybrid approach that combines the three hashing techniques to achieve more stable classification results. The system was developed using Python programming language with the aid of OpenCV, NumPy, and a simple web-based interface.

Based on the research findings on the aHash, pHash, dHash methods, and the combined approach, it is concluded that although each method has its own strengths and weaknesses—where aHash excels in sensitivity but lacks accuracy, pHash is highly accurate but less sensitive, and dHash shows the lowest overall performance—the combined approach demonstrates the most balanced performance (precision 75%, recall 50%, F1-score 60%). Therefore, it is suitable to serve as an initial foundation for a logo similarity detection system, with potential improvements achievable through preprocessing optimization, threshold adjustment, or integration with other methods such as deep learning.

Keywords: Image hashing, image similarity, fashion brand logos, combined methods, Hamming distance