
Perangkat Lunak Cerdas untuk Identifikasi Wajah Buron dengan Fuzzy Similarity Measure

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Today, terrorism problem is a popular issue in the world. To overcome this problem face identification system is needed. The system should be able to identify fast and accurately. The system must support face reconstruction process and have search facilities. The reconstruction and search process based on lip, eyes, nose, and face shape. There are different dominant features for each component, i.e., shape and color in lip feature, shape and texture in eye brow, etc. Therefore, it is possible to use different descriptor for different component. The different similarity measure is needed to handle different descriptor.

In this research, a face identification method based on fuzzy similarity measure is proposed. Each face component, i.e. face shape, eyes, lip, nose, and hair is represented with a descriptor that is adapted with the mayor characteristic of feature (shape, texture, and color). Face shape is described by a vertical quadrant distance. Another component of face is represented by eigenface. The vertical quadrant distance representation is formed by dividing face shape curve as four part with its center point as origin. A point at face shape curve is represented as a minimum distance between horizontal line -that pass through center point of curve- and the point itself. The eigenface of another component (i.e., nose, lip, eyes, and eyebrow) is extracted by PCA. There are two steps to give similarity score between two faces. First, similarity between components is computed by Euclidean distance. Second, global similarity measure is computed by aggregate function.

Performance of proposed system is measured based on precision and recall. The experiment used Indonesian face photograph. Precision and recall is calculated based on relevant judgment collected from respondent. At the ten highest searching results, the average precision is 56% at four recall point. The average computation time is 15 seconds. The experimental result shows that the proposed method can be implemented on face identification process. In the future this system support police work on crime identification.