INTISARI

Deteksi Kebohongan Berdasarkan Tanda Emosi Negatif Pada Wajah Dengan Menggunakan Pendekatan Pengklasifikasi Naive Bayesian

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Penelitian tentang analisis kebohongan merupakan topik yang sangat menarik dan melibatkan multi displin ilmu. Identifikasi kebohongan banyak digunakan dalam bidang hukum, keamanan, intelegen, dan penyidikan kepolisian. Secara psikologi, deteksi kebohongan diindikasikan dengan kemunculan tanda-tanda emosi negatif. Beberapa tanda emosi yang umum digunakan berdasarkan fisiologi tubuh diantaranya, perubahan produksi keringat, detak jantung, suara, dan kenaikan suhu pada area dibawah kelopak mata.

Pada penelitian ini, deteksi kebohongan didasarkan pada kemunculan tanda emosi negatif pada wajah, diantaranya: penghindaran tatapan mata, pandangan mata keatas, senyum palsu, kedipan, kerutan dahi, dan mata tertutup. Terdapat 3 tahapan yang dikerjakan dalam penelitian ini. Pertama ekstraksi ciri wajah, kedua pengenalan *state* ciri wajah, dan ketiga klasifikasi jujur bohong. Diluar 3 bagian tersebut terdapat satu tahapan lain, yang dilakukan oleh pakar/ psikolog untuk mengamati kejadian kemunculan *sign* emosi negatif baik pada video jujur maupun bohong. Data tersebut akan dijadikan data training pada proses klasifikasi.

Pada tahap pertama, sebuah video uji akan didekomposisi kedalam *set* citra *frame* penyusunnya. Selanjutnya pada setiap citra *frame* diekstraksi mulut, mata, dahi, pipi. Proses ekstraksi ciri wajah tersebut menggunakan pendekatan warna dan geometri wajah. Pada tahap kedua dilakukan pengenalan *state* pada masing-masing komponen wajah. Selanjutnya pengenalan *state* tersebut dilakukan pada seluruh *frame* pada *set frame,* sehingga secara keseluruhan didapatkan frekuensi kemunculan tanda emosi negatif. Berdasarkan jumlah frekuensi kemunculan *sign* emosi negatif dan *dataset training* dari pakar, dengan menggunakan *Naive Bayes Classifier* (NBC), dapat ditentukan klasifikasi bohong atau jujur video tersebut.

Secara keseluruhan didapatkan akurasi deteksi kebohongan sebesar 80%, dan dapat dinyatakan dalam penelitian ini bahwa tanda emosi negatif yang berpengaruh adalah pandangan mata menghindar dan pandangan keatas.

Kata Kunci : Pendeteksi kebohongan, tanda emosi, Ekstraksi ciri wajah, Pengklasifikasi *naive bayes*.

ABSTRACT

Lie Detection Based On Negative Emotion Signs On The Face Using a Naive Bayes Classification Approach

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The Research on the analysis of lie detection was a very interesting topic and involves many disciplines. Identification of the lie is widely used in the fields of law, security, intelligence, and police investigation. Based on psychology's principle, the lie detection was expressed by the appearance of signs negative emotions. Some signs of emotions that are commonly used by the body's physiological among others, changes in the production of sweat, heart rate, the raising of temperature in the area under the eyes.

In this research, the lie detection is based on the occurrence of sign negative emotions on the face, such as: avoidance of eye contact, eye gaze upward, fake smile, blink, wrinkle on forehead, and eyes closed. Here are 3 stages or the main parts in this study. The first stage is extraction of facial features, the second one is state recognition of facial features, and the third is classifications honest or lie. Beyond these three parts, there are the other phases was carried out by experts (psychologists) to observe occurrence of negative emotions sign on video honest or lie. The data will be used as training data in the classification process.

In the first stage a test video will be decomposed into a set of image frame. Furthermore, in each image frame was extracted face's feature such as : mouth, eyes, forehead, and cheeks. The process of extracting the facial features using an approach of color and face geometry. At the second stage was done recognition for the state of the facial feature. Furthermore, the recognition of the face feature's state performed on the entire frame in the frame set, so overall the frequency of the occurrence of the sign of negative emotions can be determined. Based on the frequency of occurrence of negative emotions and dataset training from experts, by using a Naive Bayes classifier (NBC), we can determine the classification of the video lying or dishonest.

Overall, obtained lie detection accuracy is 80%. It can be expressed that the sign of negative emotions that take effect are the eye dodge and look upwards.

Key Words : Lie Detector, signs emotion, Face's Feature extraction, Naive Bayes Classifier