

INTISARI

E-NOSE BERBASIS *INDEPENDENT COMPONENT ANALYSIS* UNTUK KLASIFIKASI TEH HITAM DENGAN SVM

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Teh merupakan minuman yang digemari hampir seluruh masyarakat dunia karena memiliki aroma dan rasa yang spesifik. Teh hitam memiliki beberapa kualitas yaitu BOP (pucuk) BPII (batang dan daun) dan Bohea (batang) dengan masing masing pengolahan selama 18 hari, 11 hari dan 6 hari. Teh hitam pernah diklasifikasi dengan beberapa metode, tetapi masih menghasilkan akurasi yang rendah salah satu penyebabnya karena sinyal yang diperoleh masih banyak tercampur dengan sinyal lain sehingga dibutuhkan metode lain untuk memisahkan sinyal asli dengan sinyal campuran agar memperoleh sinyal asli dan dapat meningkatkan akurasi.

Pengolahan data difokuskan pada pemisahan sinyal campuran. Pemisahan dilakukan dengan menggunakan *Independent Component Analysis* (ICA) sehingga menjadi komponen komponen pembentuk sinyal. Sinyal asli dan campuran dipisahkan kemudian dihilangkan sinyal campurannya dan sisanya di kontruksi kembali menjadi sinyal yang bersih tanpa sinyal campuran. Kemudian sinyal asli diolah dengan ekstraksi ciri maksimum, integral, dan difrensial untuk kemudian diklasifikasi menggunakan *Support Vector Machine* (SVM).

Hasil penelitian membuktikan bahwa sinyal campuran sangat berpengaruh dalam proses klasifikasi. Oleh karena itu pemisahan antara sinyal asli dan sinyal campuran perlu dilakukan sebelum proses lebih lanjut. Pemisahan sinyal asli dan sinyal campuran menggunakan metode ICA dinilai cukup efektif dalam meningkatkan akurasi klasifikasi yaitu mencapai 15% kenaikan akurasi dari pada pengolahan sinyal tanpa proses ICA.

Kata Kunci: *Independent Component Analysis, Electronic nose, Support Vector Machine, Clasification.*

ABSTRACT

ELECTRONIC NOSE BASED ON INDEPENDENT COMPONENT ANALYSIS FOR BLACK TEA CLASSIFICATION WITH SVM

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Tea is a drink that is favored by almost all people in the world because it has a specific aroma and taste. Black tea has several qualities namely BOP (shoots) BPH (stems and leaves) and Bohea (stems) with each processing for 18 days, 11 days and 6 days. Black tea has been classified with several methods, but it still produces low accuracy, one of the causes is because the signal obtained is still mixed with many other signals, so another method is needed to separate the original signal from the mixed signal (noise) in order to obtain the original signal and can improve accuracy.

Data processing is focused on the separation of the original signal and the noise signal. Separation is done by using Independent Component Analysis (ICA) so that it becomes a component forming the signal. The noise signal was removed and the rest was reconstructed into a clean signal without noise. Then the clean signal was processed by extracting the maximum, integral, and differential characteristics to be classified using the Support Vector Machine (SVM).

From the research was proven that the mixed signal (noise) was very influential in the classification process. Therefore the separation between the original signal and the noise signal needs to be done before further processing. The separation of the original signal and the noise signal using the ICA method was judged to be quite effective in increasing the classification accuracy by reaching a 15% increase in accuracy than processing the signal with the ICA process.

Keywords: ICA, Enose, SVM, Clasification