

INTISARI

Seiring berkembangnya kemajuan teknologi, manusia dituntut untuk bekerja lebih cepat dan efisien. Lalu mulai dikembangkan mesin-mesin pengolahan pangan dan minuman secara otomatis. Sebagai contohnya adalah *vending machine*. Selain itu, terdapat pula teknologi pengenalan ucapan oleh mesin yang dikenal dengan *speech recognition*. *Speech recognition* merupakan suatu proses untuk mengolah ucapan dari manusia agar dikenali oleh mesin melalui berbagai sistem dan transformasi dalam pengolahan sinyal ucapan manusia. Berdasarkan perkembangan teknologi tersebut, Penulis mendapatkan ide untuk merancang sebuah mesin pembuat minuman yang dikombinasikan dengan pengenalan ucapan sebagai perintah kendali.

Aplikasi pengenalan ucapan akan mengenali perintah pengguna melalui *microphone*, lalu diolah oleh komputer. Perintah yang dikenali adalah “kopi”, “susu”, “kopsus”, dan “coklat”. Ucapan yang masuk diolah dalam *preprocessing* lalu ekstraksi ciri DFT (*Discrete Fourier Transform*) dan similaritas *Dice* untuk dibandingkan dengan *database* yang telah dibentuk. Hasil pengenalan ucapan dikirimkan ke mikrokontroler melalui komunikasi serial USART. Pada mesin pembuat minuman terdapat 4 wadah cairan berupa kopi, susu, kopi susu, dan coklat yang akan dipompa oleh motor ke dalam gelas sebanyak 150 ml dengan keberhasilan 91,93%. Mikrokontroler bekerja berdasarkan data yang diterima dari komputer.

Pengenalan ucapan untuk mesin pembuat minuman telah bekerja dengan baik terhadap 3 *user*. Perintah yang diucapkan dapat dikenali dan mesin pembuat minuman telah menyajikan minuman sesuai perintah. Didapatkan hasil terbaik dengan *database* berisi 1 data, *segment averaging* bernilai 8, dan kNN bernilai 1. Program pengenalan ucapan yang diberi nilai *thresholding* dapat mengenali ucapan secara *real time* dengan persentase sebesar 89,58%.

Kata Kunci: *vending machine*, *speech recognition*, DFT (*Discrete Fourier Transform*), similaritas *Dice*, kNN, *thresholding*, mikrokontroler.

ABSTRACT

As the development of technology advances, people are required to work more quickly and efficiently. Then people start to develop automatic food and beverage processing machines. As an example is the vending machine. In addition, there is also speech recognition technology by a machine known as speech recognition. Speech recognition is a processing of human speech to be recognized by the machine through a variety of systems and transformations in human speech signal processing. Based on the development of these technologies, the author got the idea to design a beverage making machine combined with speech recognition as control commands.

Speech recognition application will recognize the user's command through a microphone, and then processed by computer. Commands that are recognized are the "kopi", "susu", "kopsus" and "cokelat". Speech incoming processed in the preprocessing and then in DFT extraction (Discrete Fourier Transform) and Dice similarity to be compared with a database that has been formed. Speech recognition results are sent to the microcontroller via USART serial communication. There are four containers of liquid in the form of coffee, milk, coffee milk, and chocolate that will be pumped by the motor into a glass of 150 ml in the beverage maker with percentage of 91,93%. Microcontroller work based on data received from the computer.

Speech recognition for beverage maker has worked well against 3 user. Spoken commands can be recognized and beverage maker has been serving drinks according to orders. Obtained the best results with a database containing 1 record, averaging segment worth 8, and kNN worth 1. The speech recognition program that rated thresholding can recognize speech in real time with a percentage of 89,58%.

Keywords: vending machine, speech recognition, DFT (Discrete Fourier Transform), Dice similarity, kNN, thresholding, microcontroller.