***Implementation of Template Matching for Voice Recognition in IoT-based
Smart Light Control System for People with Disabilities***
Sholihah Ayu Wulandari, S.ST., M.Tr.T as chief counselor

Adisty Pramudita Putri Rudi
Study Program of Informatic Engineering
Majoring of Information Technology

ABSTRACT

The development of smart home technology has driven innovations in controlling household devices, including voice-based light control systems. This system offers a potential solution for individuals with physical disabilities and visual impairments to enhance accessibility and independence in daily life. This study implements the template matching method with feature extraction using Mel-Frequency Cepstral Coefficients (MFCC) and signal similarity measurement using Dynamic Time Warping (DTW) to recognize voice commands. The templates used are speaker dependent, meaning the system only recognizes voices that have been previously recorded. User identification testing achieved an accuracy of 71.67%, precision of 78.26%, and recall of 60.00%, while voice command recognition testing reached an accuracy of 76.67%. Despite existing challenges in handling voice variation and environmental conditions, the system demonstrates reliable performance and has the potential to improve accessibility and user independence in IoT-based environments.

Key words: *Disability, DTW, IoT, MFCC, Template matching, Voice Control.*