Automobile Driver Recognition Under Different Physiological Conditions using Electrocardiogram

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This paper presents a person identification mechanism for automobile drivers under different physiological states which are rest, highway and city conditions. A total of 17 subjects were used in this study from the Stress Recognition in Automobile Drivers public ECG database (DRIVEDB) available in PhysioNet. Discrete Wavelet Transform was applied to reveal useful and hidden information in the ECG signal which are not readily available in the time domain representation. Features are extracted based on set of coefficients produced due to the wavelet decomposition process. This feature sets were then used in Radial Basis Function (RBF) for classification purposes to show the validity of using ECG to differentiate among individuals. Our experimentation results suggest that person identification is possible by obtaining 97% classification accuracy which indicates the robustness of ECG biometric implemented under different physiological conditions.