DRIVER IDENTIFICATION BASED ON SPECTRAL ANALYSIS OF DRIVING BEHAVIORAL SIGNALS

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ABSTRACT

In this paper, drivers' characteristics in driving behaviors are extracted through spectral analysis of driving signals. We assume that drivers' characteristics while accelerating or decelerating can be represented by "cepstral features" obtained through spectral analysis of gas and brake pedal operation signals and the cepstral features of each driver are modeled with a Gaussian mixture model (GMM). Driver models are evaluated in driver identification experiments using driving signals of 276 drivers collected in a real vehicle on a city road. Experimental results show that the driver model based on cepstral features achieves a 76.8% driver identification rate, resulting in a 55% error reduction over a conventional driver model that uses raw gas and brake pedal operation signals.