

An Approaching Index to Evaluate a forward Collision Probability

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Abstract : This paper presents an approaching forward collision probability index (AFCPI) for alerting and assisting driver in keeping safety distance to avoid the forward collision accident in highway driving. The time to collision (TTC) and time headway (TH) are used to evaluate the TTC forward collision probability index (TFCPI) and the TH forward collision probability index (HFCPI), respectively. The Mamdani fuzzy inference algorithm is presented combining TFCPI and HFCPI to calculate the approaching collision probability index of the vehicle. The AFCPI is easier to understand for the driver who did not even have any professional knowledge in vehicle professional field. At the same time, the driver's behavior is taken into account for suiting each driver. For the approaching index, the value 0 is indicating the 0% probability of forward collision, and the values 0.5 and 1 are indicating the 50% and 100% probabilities of forward collision, respectively. The AFCPI is useful and easy-to-understand for alerting driver to avoid the forward collision accidents when driving in highway.

Keywords : approaching index, forward collision probability, time to collision, time headway

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