LOW LEVEL CONTROL LAYER DEFINITION FOR AUTONOMOUS VEHICLES BASED ON FUZZY LOGIC

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ABSTRACT—The intelligent control of autonomous vehicles is one of the most important challenges that intelligent transport systems face today. The application of artificial intelligence techniques to the automatic management of vehicle actuators enables the different Advanced Driver Assistance Systems (ADAS) or even autonomous driving systems, to perform a low level management in a very similar way to that of human drivers by improving safety and comfort. In this paper, we present a control schema to manage these low level vehicle actuators (steering, throttle and brake) based on fuzzy logic, an artificial intelligence technique that is able to mimic human procedural behavior, in this case, when performing the driving task. This automatic low level control system has been defined, implemented and tested in a Citroën C3 testbed vehicle, whose actuators have been automated and can receive control signals from an onboard computer where the soft computing-based control system is running.