Nonholonomic robots, are mobile robots whose state at any instance depends on the path it took to get there. This is as opposed to a radially symmetric robot, which is free to rotate about its central axis, and move in any direction at any time. A car is a nonholonomic system; the direction in which it points determines the direction in which it may travel, and it must drive in order to steer in a new direction. Motivated by the additional kinematics and dynamics challenges presented in the autonomous navigation of nonholonomic robots, Cuesta *et al.* presents a mobile robot navigation scheme with a new method for dealing with fuzzy perception of the environment and to take into account nonholonomic constraints.

To integrate nonholonomic motion behavior with fuzzy-perception driven obstacle avoidance, obstacle importances were modified by their positon relative to the robot’s “direction of attention”. For their mobile robot, a ROMEO vehicle, resembling a mobility scooter, the direction of attention was parallel to the front wheels. This conveys the diminished importance of obstacles which the robot cannot move towards given its current path-dependent state, i.e. the current direction of steering. This directional importance is enhanced with virtual perception memory to keep the robot from navigating around obstacles and into gaps between them. The virtual perception memory essentially keeps recent perceptions of the environment for consideration in fuzzy rule based steering output.

These complicated temporal-geometric measures are simply used in typical Mamdani fuzzy logic controllers to implement a variety of navigation behaviors, including wall following and obstacle avoidance. Each behavior produces its own command vector. These command vectors are weighted according to the environmental context the robot finds itself in. However details on how the weights and vectors are used to produce crisp output steering and velocity are not provided.

The navigation scheme was tested on a physical robot in several environments designed to be challenging, navigationally speaking. The robot was able to navigate narrow corridors, especially challenging for a nonholonomic robot. Combinations of corridors, corners, and obstacles were also successfully navigated.

The performance of the robot in these environments using a holonomic navigation scheme would have served as an interesting illustration of the improvement their method deliver. Despite competency in navigating the environments, no such comparison was made. The paper is also math-heavy, in terms of the geometry used to calculate the rather abstract environmental metrics used. Although the application is impressive, the complicated mathematics undermine the naturally linguistic spirit of fuzzy logic to some extent.