

## Park by Wire

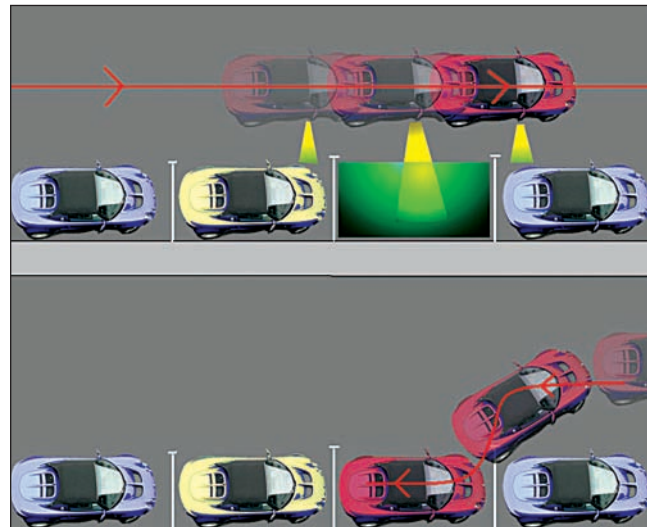
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While driving a vehicle in a congested city can be challenging, parallel parking can be especially difficult. In addition to traffic rushing by and multiple drivers competing for the same space, another challenge is that parking spaces are tight and difficult to maneuver into. Once a parking space is found, drivers need to quickly determine whether their car can fit and then park quickly.

Parking assistance systems that use control technology are already available. One supplier is Valeo, a company with headquarters in France and a presence in 26 countries. Valeo provides parking aids called ParkFit, ParkVue, and Ultrasonic Park Assist. The ParkFit system calculates the length of a parallel parking spot, compares it to the length of the car, and advises the driver on whether the vehicle will be able to maneuver into the available space. Valeo's ParkVue system helps the driver detect hidden obstacles and recommends a trajectory. While the car is moving in reverse, a miniature bumper-mounted camera supplies continuous wide-angle images of the space at the rear of the vehicle. These images are enhanced and presented to the driver on a dash-mounted LCD display. Valeo's Ultrasonic Park Assist system automatically provides information on the proximity of other parked cars or stationary obstacles. Valeo reports delivering more than 1.5 million parking aids worldwide.

Semiautomatic parking systems are being developed by several research organizations, including Volkswagen. In these systems, the driver stops beside the available space, allowing the parking assistant system to determine whether the length of the parking space is sufficient for maneuvering the car into it. If the length is adequate, the driver accelerates forward, stops, and then shifts to reverse gear, which engages the parking assistant. The parking assistant automatically steers the vehicle into the parking space as the driver gently presses the accelerator pedal. The accelerator pedal connects the driver to the parking assistant, allowing the driver to be in control of the parking assistant at all times. Parking assistance systems require an automated steering system such as active steering or steer by wire.

Truly autonomous parking assistant systems, in which the vehicle parks automatically once the dri-



The parking assistant uses ultrasonic sensors to check the size of the available parking space. The driver then moves forward and engages the parking assistant by pressing on the accelerator pedal. Steering becomes automatic, and the vehicle goes into reverse gear. Sensors warn the driver of obstacles.

ver has chosen a parallel parking spot, are not yet available. Such systems require automated throttle and brake control along with automated steering ability. With the current trend toward drive-by-wire vehicles, we can expect to see these autonomous parking systems in the near future.

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A century from now there will be two prime sources of energy—nuclear fusion and solar power collected in space.

Isaac Asimov, from a 1978 letter printed in *Yours*.

Either Or