

## Cooperative Control School

As many of you know, one of the most exciting applications of control technology is cooperative control of multiple vehicles. Applications range from highway automation to formation flight of aircraft and spacecraft. Cooperative control promises more efficient transportation systems as well as the ability, in the case of cooperative spacecraft, to image planets around distant stars.

Now imagine a cooperative control problem in which the path of one group of vehicles crosses the path of another group of vehicles. In view of possible collisions, this challenge would give even the most hardy control engineer pause. Nevertheless, G. Murchie writes in his fascinating book *The Seven Mysteries of Life: An Exploration in Science and Philosophy* (Houghton Mifflin Company, Boston, 1978, p. 507) that "Mackerels, herrings and similarly shaped fish . . . are . . . so ingrained in schooling that they lose the power to make certain unusual or irregular movements . . . [A] well-established school . . . is so stable in structure that two large schools of half-grown fish have been seen passing straight through each other at different angles with no more apparent disruption or interaction than if they had been two puffs of smoke."

In the illustration below we envision the mundane event of two schools of fish passing through a typical "fish intersection," an awesome sight to even the most jaded control engineer.

