

# Trajectory Following

**Objective:** Given a desired orbit or waypoint path, precisely follow the path even in heavy winds.

**Principle Investigators:** Tim McLain, Randy Beard

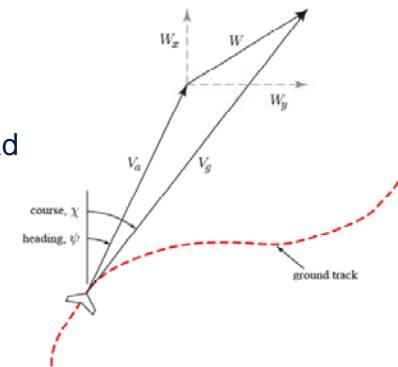
**Sample Publication:** Derek R. Nelson, Blake Barber, Timothy W. McLain, Randal W. Beard, "Vector Field Path Following for Miniature Air Vehicles," *IEEE Transactions on Robotics*, vol. 23, no. 3, June, 2007, p 519-529.

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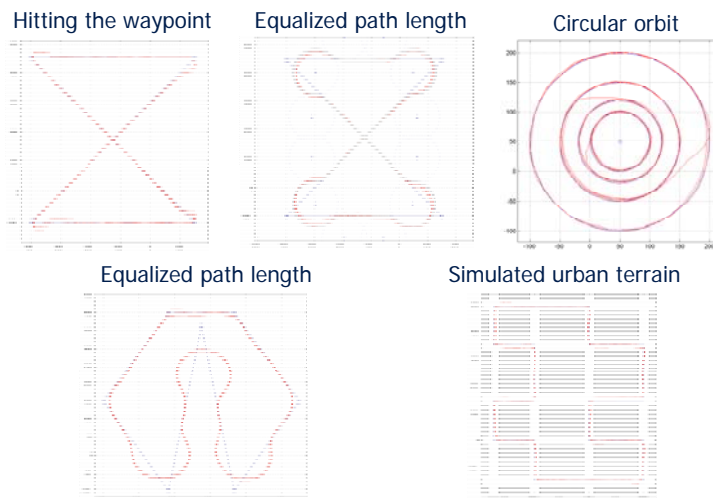
## Vector Field Method

Two key characteristics:

- > Path following instead of trajectory tracking
- > Be "on the path" vs. "follow the rabbit"
- > Controlling course instead of heading



## Flight Test Results



## Key Accomplishments

First successful flight test in 2003.

Robustness to wind disturbances

Avg tracking error less than 3 wingspans when wind is 30 to 50% of commanded air speed

Licensed to Procerus Technologies in 2004 as part of the Kestrel autopilot system.

Hundreds of hours of successful flight tests.