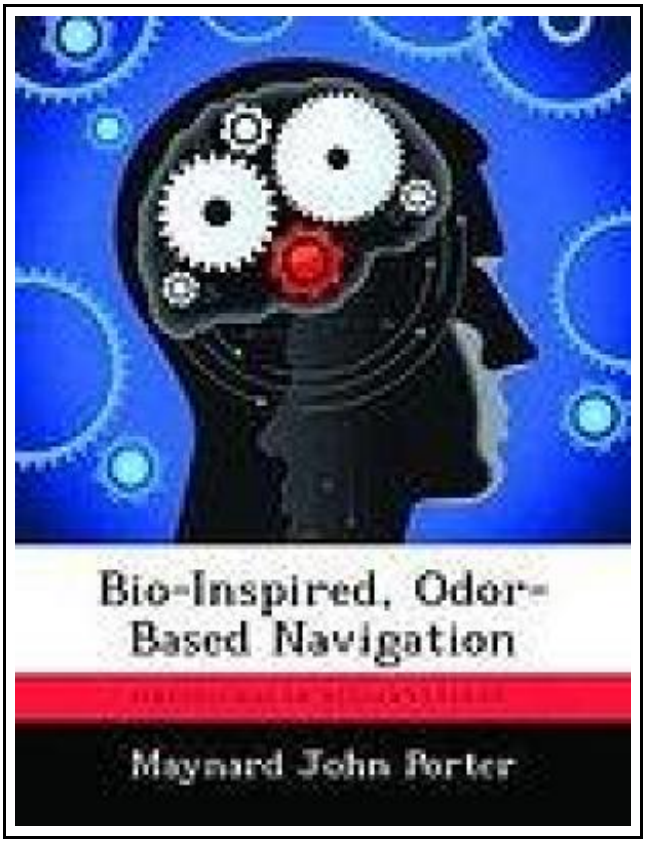
# Bio-Inspired, Odor-Based Navigation

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### *Reviews*

*Completely essential go through book. It really is simplistic but excitement inside the 50 % of the pdf. I am very easily will get a satisfaction of studying a composed book.*
***(Damian Pouros)***

# BIO-INSPIRED, ODOR-BASED NAVIGATION



Biblioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x11 mm. This item is printed on demand - Print on Demand Neuware - The ability of many insects, especially moths, to locate either food or a member of the opposite sex, by tracking a wind-borne plume of odor molecules, is an amazing reality. Numerous scenarios exist where having this capability embedded intoground-based or aerial vehicles would be invaluable. The main crux of this thesisinvestigation is the development of a navigation algorithm which gives a UAV theability to track a chemical plume to its source. Inspiration from the male moth's,in particular Manduca sexta (Tobacco Hornworm moth), ability to successfully tracka female's pheromone plume was used in the design of both 2-D and 3-D naviga-tion algorithms. The algorithms were developed to guide autonomous vehicles to asource generating an odor/chemical plume, using only the odor/chemical informationprovided by the plume.The algorithms were implemented using a variety of fuzzy controllers and adhoc engineering approaches. The fuzzy controller, critical to the success of bothalgorithms, was developed to estimate the location of a vehicle relative to the plume:coming into the plume, in the plume, exiting the plume, or out of the plume. Analysisof plume detections within a short-term memory bank provided the basis for thiscontroller.To test these algorithms, 2-D and 3-D simulation environments were developed. 188 pp. Englisch.

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