

## عنوان مقاله:

On the Performance of an Intelligently Tuned Fractional Order PID Roll Controller

## محل انتشار:

سومین کنفرانس ملی و اولین کنفرانس بین المللی پژوهش های کاربردی در مهندسی برق، مکانیک و مکاترونیک (سال: 1394)

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## خلاصه مقاله:

Due to economic reasons, mostly just a rough model for Unmanned Aerial Vehicle (UAV) systems is available for control design. Besides, its low weight makes it more vulnerable to wind gust and environmental disturbances. Hence, design of robust controls for UAV's has gained more attention. In this respect, fractional order PID (FOPID) controllers as a robust control for roll stabilization of UAV is studied. Fractional order controllers give more flexibility in design than what traditional integer order controllers provide. For optimizing the controller performance, the parameters of FOPID are tuned using evolutionary algorithms. The proposed control method is simulated using a fixedwing UAV mathematical model on MATLAB platform. There is drastic improvement in the performance of the system in facing 20% parameters tolerance, wind gust disturbance, payload variation and command following. The simulation results confirm the superiority of the design versus the performance of the well-tuned basic PID.

## کلمات کلیدی:

UAV, Fractional Order Control, Intelligent Tuning, Wind Disturbance, GA, PSO

## لینک ثابت مقاله در پایگاه سیویلیکا:

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