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Increasing Performance of Autopilot Guided Small Unmanned Helicopter

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Abstract : In this paper, autonomous performance of a small manufactured unmanned helicopter is tried to be increased. For this purpose, a small unmanned helicopter is manufactured in Erciyes University, Faculty of Aeronautics and Astronautics. It is called as ZANKA-Heli-I. For performance maximization, autopilot parameters are determined via minimizing a cost function consisting of flight performance parameters such as settling time, rise time, overshoot during trajectory tracking. For this purpose, a stochastic optimization method named as simultaneous perturbation stochastic approximation is benefited. Using this approach, considerable autonomous performance increase (around %23) is obtained.

Keywords : small helicopters, hierarchical control, stochastic optimization, autonomous performance maximization, autopilots
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