## Auto landing using fuzzy logic

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**Abstract:** Fuzzy logic controllers (FLCs) are increasing its popularity as replacement of the conventional control methods. The FLCs finds their usage in all kind of processes: industrial, medical, environmental etc. The FLCs are used in this publication for auto landing of an airplane.

Landing procedure for any aircraft consists of several parts. This paper puts stress on the actual descending and touch down phase of the landing. During the landing procedure the aircraft goes through three phases: the descending, the flare manuvar and the actual touch down. The descending trajectory is steady descend on strait line from a start altitude, down to a several meters from the ground level. In that point the aircraft should proceed with a flare manuvar. The flare manuvar is actually changing the attack angle of the aircraft from steep descend to a small elevation. This manuvar allows the aircraft to decrease its vertical down speed. This short manuvar is followed by the actual touching down of the aircraft.

The aircraft used in this paper is an Unmanned Aerial Vehicle (UAV) model given in the Aerosim adds in Matlab. The model of the airplane itself is unstable and before any simulation is made with it, there is a need to stabilize it. The stabilization of the Aerosim add model in MATLAB is performed by using conventional techniques of PI, PD and / or PID controllers. In order to remain consistent in the whole publication, the authors of this publication managed to replace the PID controllers with suitable FLCs.

As input signals to the FLC responsible for the landing of the airplane, only simple triangle and trapezoid membership functions are used and only 12 rules create the output of the FLC which actually gives the attack angle of the airplane.

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