N.I.M.P.H.A. (Neural Network Interface for Monitoring Plants via Hybrid Aircraft)

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Rainerum Robotics is a group composed by students and teachers from the Rainerum High School. For over nineteen years our team has been developing advanced robotics projects and has had opportunities to work on various projects concerning the prototyping and subsequent construction of autonomous aircraft. While we were analyzing problems related to our territory we realized how important it is to monitor the health status of large areas of vegetation and detect early possible outbreaks of parasitic infections. Thus was born N.I.M.P.H.A. (Neural Network Interface for Monitoring Plants via Hybrid Aircraft), a hybrid drone that combines the main characteristics of a multirotor drone with those of an aircraft: this guarantees manoeuvrability and rapidity of manoeuvre (thanks to the lift of two wings), as well as allowing fast altitude change and take-off and landing even in the absence of a runway. The final result of our project is a semi-autonomous droid: a neural network developed by us and subsequently installed on board ensures that, thanks to adequate sensors, the aircraft is able to move autonomously and successfully reach a target (in our case, the coordinates that identify the diseased vegetation area). But that's not all, there are other numerous possible fields of use for N.I.M.P.H.A, for example determining the stability of mountainsides and water basins' volume, support rescuers in case of disasters and volumetric estimate of landslides.