

DESIGN, DEVELOPMENT AND TESTING OF AN UNMANNED AERIAL VEHICLE EQUIPPED WITH WEATHER PROFILING SENSORS

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The advent of the unmanned aerial vehicle (UAV) or the drones have helped in military, agriculture, atmospheric profiling and many other sectors. This project focuses on the major design of the UAV and the result of equipping the system for weather profiling. With a 2m wing span UAV which last longer than 1 hour in the air during full flight, having an on-board auto pilot equipped with the latest first person view (FPV) devices, this UAV was designed using professional mechanical software and locally produced materials like the Styrofoam (which were used in constructing the fuselage and the wing). Some major sensors to provide weather parameters (like the temperature, humidity, altitude, greenhouse gases; CO₂, water vapour, nitrous oxide and ozone) and GPS receiver were on board the UAV.

The result of the test provided aerial imaging with the geographic coordinate of the aerial of flight and also the horizontal profiling of weather parameters at different locations of the earth. When weather profiling data are to be taken at different geographical locations at different altitudes, this type of system should be more used as it provides more assistance to the ground weather station in taking more accurate data.

Biography of the club

The Space Club Obafemi Awolowo University (OAU), is the student arm of the Outreach Division of the African Regional Centre for Space Science and Technology Education - in English(ARCCSSTE-E), and affiliated to the United Nations. The Club has her main research lab situated at the Faculty of Agriculture building of the University. The Space Club OAU primarily focuses on space educations, training programs, workshops, seminars, research and projects. The Club embarks on space science technological projects to further strengthen

members' understanding of space science and technology. The Club organizes seminars at different times of the academic session which enhance the growth of the Club and her members. Membership is open to the students of Obafemi Awolowo University, regardless of the Department.

The Club also aids in proper understanding and enlightenment of different space related activities happening in the space industry as applicable in the immediate environment. The quest of the Club to further research and continue space education amidst the populace continues to increase and there are still a large number of the Nigerian society that lack basic knowledge about space.

Biography of the head researcher

GEORGE A. OKEREKA is a graduate of the department of Mechanical Engineering Obafemi Awolowo University, where he developed passion for fluid dynamics and the design of unmanned aerial vehicles. Aside been a mechanical engineer, he also writes computer programs and is proficient in various programming languages such as Java, HTML, CSS, PHP, MySQL, Android and Embedded C. He has extensive experience in 3D CAD modelling, use of Ansys simulation software and embedded systems programming (IoT related).

George was the project manager for the design and construction of two UAVs, one of which was designed to gather atmospheric data through sensitive environmental sensors. He's currently working on a third UAV were he hopes to test out some new designs. He was a finalist in the Airbus Fly Your Idea Competition 2017, where his teammates presented their ideas in France, Toulouse being the first team from Africa to make it that far.

Currently, he helps out in the department of mechanical engineering where he teaches and mentors fresh mechanical engineering students under a community program called Mech Alive which he helped co-found. He's currently applying to schools abroad to study a master's degree in aeronautic engineering.

The link for the picture:

[Advanced UAV — Postimage.org](#)