**Research Plan 2016**

***Instruction to Students:***

1. Discuss with your research mentor the planning and implementation issues of your project before completing this form.
2. Submit the completed form together with SSEF Forms to your teacher-advisor.

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| **STUDENT NAMES**  **Sundaramahalingam Sudharshan**  **Isaac Tay Eng Hiam** | **SCHOOL**  NUS High School |
| **External MENTOR**  **Professor Prahlad Vadakkepat** | **External INSTITUTION**  **National University of Singapore** |
| **NUS High Teacher Mentor**  **Dr Chiam Sher Yi** |  |

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| **TITLE OF PROJECT**  A novel and multipurpose autonomous drone platform |
| **PURPOSE OF RESEARCH**  (including Hypothesis/Problem/Goals  Drones are becoming exceedingly common in a multitude of industries. The drone industry is also showing incredible potential to grow in the years to come as many industries such as agriculture show interest in using these drones for commercial purposes. Currently, the most common type of drone, the quadcopter, has a few performance pitfalls which hinder its implementation into real life drone solutions including affordability, accessibility and modularity. This project aims to build a novel drone design which is capable of fixing these pitfalls and providing a platform that can be easily modified and implemented into niche drone solutions. |
| **METHODOLOGY**  We will be going through several design phases of prototyping, evaluation and redesigning to ensure that we get the most ideal platform for us in education. |
| **LIST OF EXPERIMENTAL TECNIQUES USED**  NA because it is an engineering project |
| **BIBLIOGRAPHY**  1 Ale Zavrnik, editor. Drones and Unmanned Aerial Systems. Springer International Publishing, 2016.  2 Sarah Kreps and Micah Zenko. The next drone wars; peparing for proliferation. March 2014.  3 Miranda Green. Unmanned drones may have their greatest impact on agriculture. 2013.  4 Amenyov and John-Thones. Medizdroids project: Ultra-low cost, low-altitude, affordable and sustainable uav multicopter drones for mosquito vector control in malaria disease, 2014.  5 Aznar and Pujol. Modelling oil-spill detection with swarm drones, 2014 |

**PROPOSED TIMELINE**

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| **Phase** | **Task** | **Date/Duration** |
| **Design** | Design and build a new frame design based on the existing coax-copter model which enhancing and optimizing the frame for quick implementation and modularity | 12-31 October 2016 |
| **Design** | Design and build a new electronics platform and board | 1-15 November 2016 |
| **Design** | Design and build the software needed for the drone to operate | 15-30 November 2016 |
| **Test** | Test and verify results to make sure all expectations are met | 1-15 December 2016 |
| **Modification** | Modify prototype as per testing result | 15-20 December 2016 |
| **Report Writing** | Write the research paper | 20-30 December 2016 |
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