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| GENERAL PROJECT INFORMATION | |
| Project Name | **Project ID / Number** |
| Reaction Wheel Control of Air-Bearing Floating Robots |  |
| **Date Prepared** |
| 08-March-2023 |
| Project Sponsor | |
| University of Surrey | |
| Project Manager | **Customer** |
| Jorge Chavarin | - |
| Other Project Stakeholders | |
| Surrey Space Centre  Dr. Nicola Baresi | |
| Stakeholders Responsibilities | |
| Jorge Chavarin – Master student build the project,  Dr. Nicola Baresi – Project Tutor,  University of Surrey / Surrey Space Centre – Lend facilities and tools to do the project. | |

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| SCOPE STATEMENT |
| Business Need and Problem Statement |
| The Air-Bearing floating robot of the Surrey Space Centre, needs an Attitude Control System to be able to orientate to a specific point (angle) detected by a camera in the “sky”. |
| Project Goals and Objectives (Deliverables) |
| * Design a 3D model of the robot, within any assemble errors, and find its moment of inertia, using SolidWorks, within the first 2 weeks.   + FEPS Faculty Admin, Luca Ferrian, to provide partial design of the robot, missing parts should be created in 3D with same measurements as the real ones from the floating robot.   + 1-2 weeks * Design and model the Reaction Wheel system in SolidWorks, according to robot measures. The system includes the motor, wheel, bearings, shaft, sensors (gyroscopes), frame and adaptors, electronics (Raspberry Pi, camera) and any other part used for the Attitude Control system. (1-2 weeks) * Design a control law for the system in Simulink in order to have a correct reaction of the simulated plant (Software in the Loop). * Robot will rotate precisely to the given angle in a time frame. |
| Benefits |
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| Metrics |
| * Angle precision. * Time of rotation / angular velocity of the robot. |

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| SUPPORTING DETAIL |
| Cost |
| * MATLAB with Simulink license (TBD) * SolidWorks license (TBD) * Manufacturing /3D print of pieces (TBD) * Hardware (£105 - £150)   + Raspberry Pi (£64-£78)   + Raspberry case with Fan (£10)   + Camera (£26-£57)   + Camera Mount (£5)   + BDCL motor 536-6024 (£54.84) |
| Project Completion Date |
| * First Report: 13/03/2023 * Interim Review: 29/04/2023 * Final Report: 03/09/2023 * Viva Presentation: 03/09/2024 – 15/09/2023 |
| Assumptions |
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| Links to Strategic Objectives and/or Other Projects |
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