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| IE3510 SYSTEM MODELLING PROJECT PROPOSAL |
| Subject: Requisition of the project topic feasibility |
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| Topics have chosen as below listed:  1. Search and Rescue - Metal dedication  2. Step Climbing robot  3. YOGA Teacher with traceable (reminder) ability  4. Drone robot with camera |
| Topic 1: Search and Rescue - Metal dedication  Description: Under the branch of search and rescue, metal detection is one of the key roles if the robot has this diagnostics feature. Our primary purpose of this topic has consideration into metal detection which could be used for the safety applications. Lego EV3 has the capability of 4 sensor connection, we could have one of the sensor used for identifying metals and gives an input to Robot controller, and further based on the upcoming algorithm we would think about the decision to be taken (in case of passing information and showing by GUI or some other platform).  Risks: Here we find risk in the sensor part. We have Inductive proximity sensor NPN or PNP sensors available in market for the metal detection, but we have struck in the risk of managing with Lego EV3. We could not able to find the specification talks about inbuilt of this sensor and whether can it be connected externally? If this is feasible with external power supply of 12V. .    References:  <https://www.cdiscount.com/bricolage/electricite/lj12-a3-4-z-ay-pnp-nc-4-mm-detecteur-de-proximite/f-1661416-sou0702105987803.html?idOffre=635468957&cid=search_pla&cm_mmc=PLA!COR!AUT!MP!984091388!m144813004_pSOU0702105987803-635468957_l9056499_tpla-951357223183_&gclid=EAIaIQobChMI5qSNu62d8wIVE9xRCh2PbgBcEAQYAiABEgIdyvD_BwE>  Topic 2: Step Climbing robot for helping to carry materials at height instead of human  Description: By choosing these topic of “Step Climbing robot” we are trying to achieve the results or serve the purpose, where human go to the height with heavy materials like cables, electronic kits (e.g.: cell phone tower applications), Instead of humans, we shall use robots for those applications. If would help in prevention of risking human life’s and also valve addition in the technology domain.    Risks: Lego EV3 has the motor capacity of speed 170 to 250 rpm and torque 0.08 to 0.21 N-m , here we have to clarify the stability whether it can be sustained when it in terms of degree of rotation as well with materials carry.  References:  <https://www.shutterstock.com/search/robot+climbing>  <https://hal.archives-ouvertes.fr/hal-01875387v6/document>  <https://www.researchgate.net/publication/303549760_STAIR_CLIMBING_ROBOT>  Topic 3: YOGA Teacher with traceable ability  Description: This topic we have chosen for the purpose of teaching selected exercise poses to the peoples, which would come under health benefits. As this moment, as compare to technology development, we are seeing downfall in the human health by doing continuous system oriented jobs. Handy robot can remain humans, who are doing continuous constant position jobs with an alarm. Handy robot can show some mandatory poses *like humans to shake their heads, move their knees, showing some different colors to see avoid contact from machine monitors continuously.*, etc..Assuming that, keeping handy robot at our working desks would help a lot.    Risks: Lego EV3 has capacity of four sensors; here the functionality what we want to add is that robot rotation till some degrees, identify the degrees of fall and stop, integration of accelerometer sensors which can help for these types of applications.  References:  <https://www.mdpi.com/2227-7080/6/1/32/htm>  <https://www.researchgate.net/publication/296970008_A_Robot-based_Application_for_Physical_Exercise_Training>  Topic 4: Drone robot with cameras  Description: Choosing this topic “Drone robot with cameras” for the purpose visualization of the objects, Pouring liquid over small plants, take snapshot,etc. About this topic, already there are many research papers are found and implementation wise, hardware requirements need to be so powerful. But what we were trying to achieve is, if there is any possibility to integrate Lego with external hardware components to achieve the purpose.    Risks: Hardware requirements like motor power need to be managed; multiple cameras integration is the other point to be clarified.  References:  <http://robotsquare.com/2012/03/02/flying-lego/>  <https://www.sciencedirect.com/science/article/pii/S1319157820304237> <https://ieeexplore.ieee.org/document/6385917> |