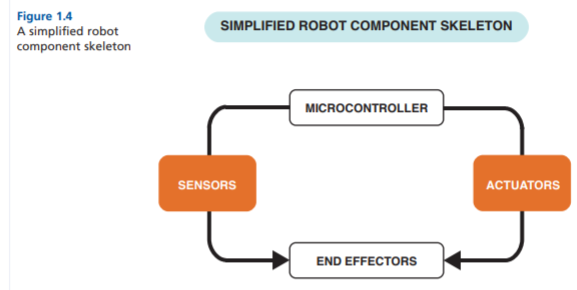
## Framing

|  |  |
| --- | --- |
| Stakeholders | **Praxis student design team**  Praxis teaching team  Electric car owners / potential users of the design  Electric car manufacturers  Environment |
| Higher-level objective | Design an autonomous device that will locate an SAE J1772 Type 1 electric car charging port, deliver the plug to the charging port, and insert the plug into the charging port |

|  |  |  |  |
| --- | --- | --- | --- |
| Detailed Objectives | Metrics (bolded are interesting) | Criteria | Constraints |
| Functionality / **Reliability / Capability** | Designed operating lifetime | + is preferred | Must not break down during each milestone test |
| Frequency and time needed for maintenance | - is preferred | Must not damage the test rig  Setup on the environment must be easily removable without any residue, in under a minute |
| Area coverage | + is preferred | Must be able to reach the 0.5m x 1m operating boundary, at 0.37 m in height |
| Time taken to complete the operation | - is preferred | Must take fewer than two minutes |
| Ease of **Assembly** | Time taken to complete the setup of the operation | - is preferred | Must take fewer than three minutes |
| **Cost-effective** | Cost of components and shipping | - is preferred | Less than $300 |
| **Safety** | # of areas that can potentially cause harm to users | - is preferred | Must adhere to safety standards (power supply must be UL, CSA approved, etc)  Must not have any possible high voltage contacts exposed  Must not have hazardous radiation emitted |
| # of fail-safe features | + is preferred | Must have a distinct way to command the start of design, and an emergency stop button/switch to stop all actuators |
| Ease of **Testing and Diagnostic** | Time taken to debug an error within the system | - is preferred | Clean circuit design philosophy must be implemented |
| Reaching Additional Setting | Capable of plugging in the 3D printed dummy | Pass is preferred |  |
| Capable of plugging in the real J1772 charger plug | Pass is preferred |  |
| Capable of retracting the plug after plugging in and returning to a repeatable start location | Pass is preferred |  |
| Capable of completing yaw | Pass is preferred |  |
| Capable of locating the charging port at different heights between (0.37, 0.60) m | Pass is preferred |  |

~~Detailed Objectives for Individual Component~~

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