**Project Title:**Improving Robotic Arm performance by using an FPGA For Control

**Proposer:***Self*

**Supervisor:***If Known*

**Objective**

* The Objective of this project is to be able to control a robotic arm using only a Field Programmable Gate Array / hardware with no external processing.
* The ultimate goal of this project is to use the FPGA's potential for parallel processing to quickly complete kinematics calculations and provide instructions to an arm while eliminating programming related delays.

**Staged Deliverables  *(at least 4)***

* *What constitutes a PASS (40%+)*
* *Controlling the arm with the existing microprocessor while using the FPGA to do the kinematics calculations, proof of concept but final goal not achieved.*
* *What constitutes a 2:2 Mark (50%+)*
* *The microprocessor has been removed and the FPGA is fully controlling the arm completing simple instructions.*
* *What constitutes a 2:1 Mark (60%+)*
* *A soft core processor has been implemented to eliminate state machines and allow for more complicated instructions and features.*
* *What constitutes a FIRST CLASS Mark (70%+)*
* *The arm is capable of avoiding obstacles and completing a 3D maze, some form of control or machine learning has been implemented to verify/guarantee the arm's movements are accurate.*

**Description:**

* *Describe the project in non-technical terms. This should contain detailed actions of how your aims and objectives will be achieved. Text should be augmented with Block Diagrams*.

**Resources**

* *State assumptions about resources allocated to this project*
* *Equipment*
* *DEO-CV- Development board using Altera Cyclone V FPGA Device – Booked out of Smeaton Store*
* *Desktop Robotic Arm -  Booked out of Smeaton Store*
* *Locations*
* *Support & outside services*
* *Manufacturing*
* *Minimal required – 3D printing may be used to create 3D maze*

**Schedule**

* *Review schedule milestones here*
* *When do you expect the staged deliverables to be complete*

**Related Documents**

* *Data Sheets*
* *Web Pages*
* *Books*