**ECE 385**

**Project Proposal Form**

After ensuring that your project idea is unique, you will use this form to describe your project (point form acceptable), assess its difficulty, and outline what you expect to achieve each week of your project work. You **must give the filled form to your TA at the beginning of the first project lab session.**

The TA will advise you if changes are needed to your project proposal so it is sufficiently, but not overly challenging. After you implement the changes, **the TA will then approve and sign your project proposal.** You will then make **two copies** of the final filled form: one will be held by the TA, and the other one will be for your reference. Your ability to successfully implement all that was approved in your proposal will determine your project functionality marks

# Group Info

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| --- | --- | --- | --- |
| **Station Number** | **First Name** | **Last Name** | **Contribution [0..100]**  **(filled during final lab)** |
| 64 | Jinnan | Lu |  |
| 64 | Christopher | Bathgate |  |

# One Sentence Project Description (as posted)

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| Given a string, convert it into a morse code representation then print it out on paper using a custom made printing device. |

# Technical Description of the Project

Describe your project in more technical details and include a system block diagram.

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| The system first consists of wheels and motors to guide a roll of paper through the printing system. On start up, the wheels will spin to draw in the roll of paper towards the printing mechanism. Once the user sees that the paper is aligned with the printing mechanism, they will flick a switch and the printing will commence. The printing module in the center of the paper tract uses levers that are controlled by motors and connected to markers . The levers press their markers against or retract away from the paper that is being filtered through by the guiding wheels. This can be used to create sentences of morse code.  The bit string or ACII string used will be hardcoded in a variable declared by the user. Each character will be matched with the dot/dash pattern of morse code. Our implementation of the printer will support three markers and thus the string will be divided into three lines. Once the paper is set up in the machine, the lines of morse code would printed in a coordinated fashion amongst the levers. Each character per line is not printed simultaneously thus levers have to synchronize to make sure characters are vertically aligned. On finish, the guiding wheels would stop.  The program used to coordinate the printer will have three parts, the conversion of ACII characters to morse and translating that into a pattern to use to print, the synchronization and motor controls of the printing levers and the paper guiding system which coordinates with a switch and the printing mechanism.  The mechanism is diagramed below...  IMG_0123.JPG |

# Assessment of Project’s Difficulty

Please check off each accomplishment you propose in your project and indicate whether that accomplishment was interrupt-driven (if applicable). For accomplishments with multiple units such as the LEDs, switches, motors, etc., indicate the number of such units used. For example if you are using two Lego motors place the number 2 in the column instead of a checkmark.

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| **Accomplishment** | **Proposed?** | **Interrupt?** | **Demonstrated?**  **(to be filled by your TA)** |
| LEDs/Switches | Check | N/A |  |
| Push buttons |  |  |  |
| Digital protoboard |  |  |  |
| VGA |  | N/A |  |
| LCD |  | N/A |  |
| Custom random number generator |  | N/A |  |
| Lego motors | Check (5) | N/A |  |
| Lego sensors |  |  |  |
| Linking C with assembly | Check | N/A |  |
| JTAG UART transmit | Check |  |  |
| JTAG UART receive |  |  |  |
| Timer 0 | Check | Check |  |
| Timer 1 |  |  |  |
| Hexkeypad (rows or columns only) |  |  |  |
| Hexkeypad (rows and columns) |  |  |  |
| RS-232 UART transmit |  |  |  |
| RS-232 UART receive |  |  |  |
| DMA transfer |  |  |  |
| Nios II Custom Instruction | Check | N/A |  |
| Audio Codec output to speakers |  |  |  |
| Audio Codec input from microphone |  |  |  |
| PS/2 Keyboard |  |  |  |
| PS/2 Mouse |  |  |  |
| SD Card Reader |  |  |  |
| Custom Bus Component |  |  |  |
| Ethernet |  |  |  |

Please describe any other devices or complex software algorithms you will use. Remember to keep this relevant to ECE385 (not fancy electronic circuits or complex mechanical systems).

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# Project Milestones

Describe what parts of your project you will have fully implemented in each of the three project lab sessions. Keep in mind that you will have to demonstrate your project during the third project lab session. The key here is to design incrementally: get something working quickly and keep adding to it. TAs will not accept the “integrate everything in week 3” approach.

## First project lab session

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| Build the lego structure and printing mechanisms and connect all the wiring of the device to the lego controller. Make sure all the connections are properly connected and that the structure carries out what it's meant to do. |

## Second project lab session

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| Motors for the printing functionality raise / press the markers in a controlled fashion and synch up with the paper guiding motors that can be turned on and off. Levers will be made to to follow a basic pattern to assure functionality. |

## Third project lab session

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| Levers will be synced so the messages will be vertically aligned and convey a clear dot / dash pattern. A string convertor will be developed that takes a string, converts it into morse codes then converts it into a bit strings that can be understood by the system (each bit represents a period of time like 1 second, setting the bit to one will press the marker, 0 will release the marker. 01110 will represent apply, dash, release. 010 will represent apply, dot, release) |

# TA Notes

Final pages are filled by your TA.

## Approval

Approved by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## First project lab session (the week of March 19)

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## Second project lab session (the week of April 2)

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## Third project lab session (the week of April 9) – Demo

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## Notes on Final Result

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# Extra Notes