

Certus Engineering

Capstone Project | ENSC 440/305W

Farshadi | Desai | Sabau | Bertsch | Petrouchtchak | Bashi

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Farshad Farshadi
Chief Executive Officer



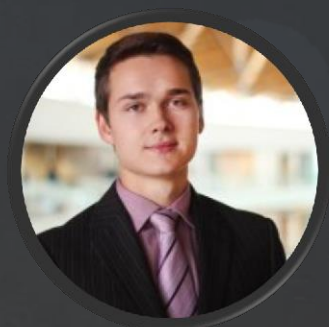
Chinmay Desai
Chief Operations Officer



Kevin Sabau
Chief Technology Officer



Paniz Bertsch
Chief Controls Officer



Juri Petrouchtchak
Chief Financial Officer



Amir Bashi
VP Manufacturing

Team Roles

& Farshad Farshadi

⌘ Software Co-Head (Optical Character Recognition)

& Chinmay Desai

⌘ Documentation & Hardware Co-Head

& Kevin Sabau

⌘ Hardware Co-Head

& Paniz Bertsch

⌘ Software Co-Head (Radio Frequency Identification)

& Juri Petrouchtchak

⌘ Marketing & Finance

& Amir Bashi

⌘ Production & Testing

Goals

- & Create a unit that would expedite parts distribution for lab courses
- & Allow the system the to record various personnel information
- & Unit should be used as an attendance tracking system for school & businesses
- & Create a reliable unit that can be used over and over again without failure
- & All of this should be done via a unit that's cost effective & has a user friendly interface



Background

- & Parts distribution for lab courses can take up to several days & is an inefficient system
- & Even manually taking attendance for courses/business meetings is inefficient
- & There needs to be a faster way of doing all this without overcomplicating the new system



Closest Competitor

& Handheld barcode scanner can cost anywhere from \$100 – \$600 and even up to few thousand dollars



Honeywell \$506.63



IDVisor 310 \$1,395



Wasp WLS 9600 \$417.19

Prices taken from www.staples.ca

Other Competitor

- & Tricom Card Technologies & Treoscope development of age and identity verification systems
- & Limited capabilities to barcode scans only, and software provides limited interface options



Motivation

- & Similar products are very expensive & have a steep learning curve in terms of software
- & Competitors' products only read the barcode, but what if an ID doesn't have one?
- & Need a simple user friendly design that's cost effective
- & Use this device here in Lab 1 to make Fred's life a little easier



Main Features

- & Device will read barcode, identification number, and the RFID value
- & It will also take a picture of the user and store it in the database to prevent anyone else using their card
- & This system has four main stages: Detection, Authentication, Distribution, & Collection



System Overview

Stage One: Detection

- ⌘ User is given an identification card with an RFID tag embedded and then the card is read by the unit

Stage Two: Authentication

- ⌘ The unit will read the RFID/barcode/ID number and match it with that in the database

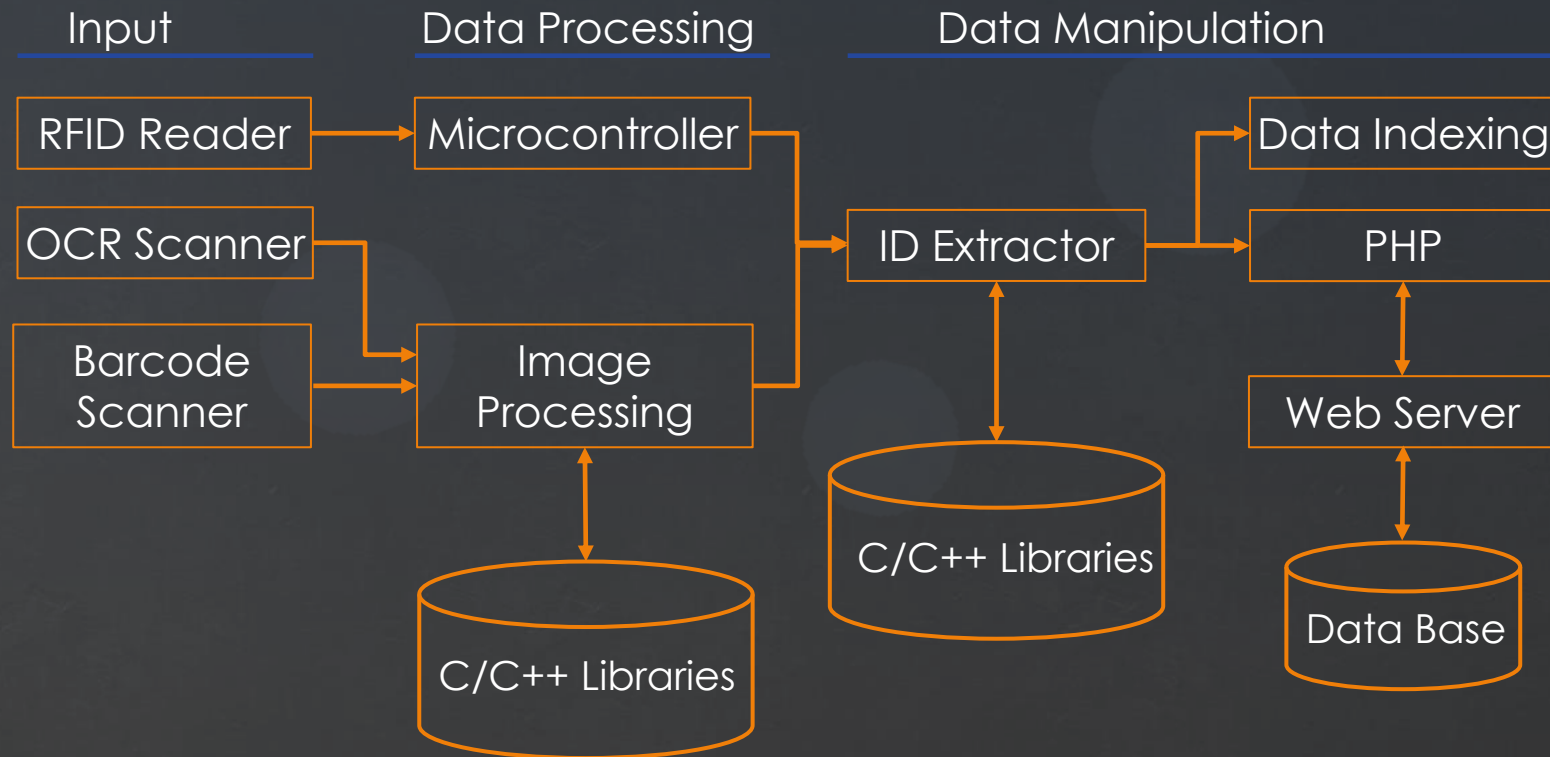
Stage Three: Distribution

- ⌘ Allows the operator to efficiently distribute any tools or parts through a friendly user interface

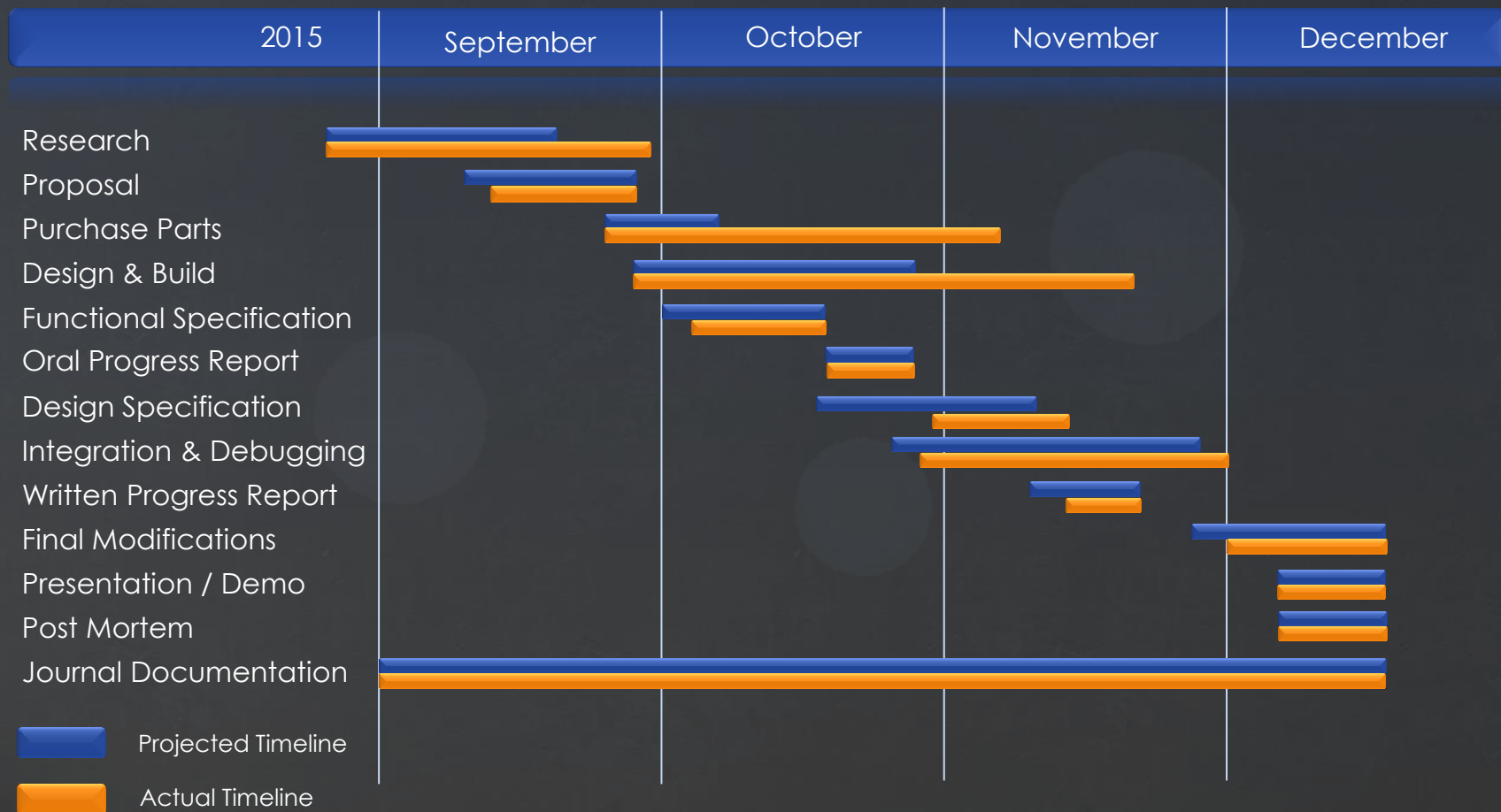
Stage Four: Collection

- ⌘ Data collected will be stored as a readable file

System Overview

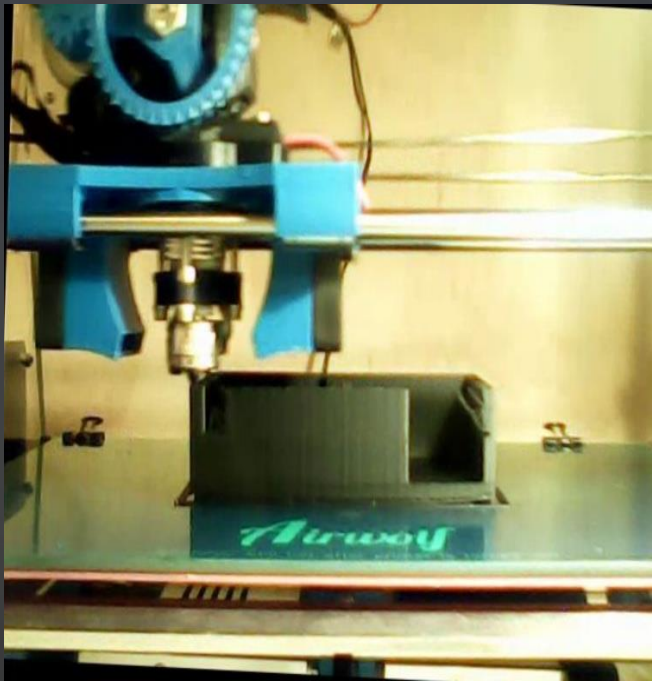


Project Schedule



Causes for Delay

- & Parts often did not work properly
- & Issues with the 3D printing
- & Other commitments (Midterms/Finals)



Budget

- & Our principal investors were *Miller Instruments* who expressed an interest in our design early on
- & Dr. Ash Parameswaran was kind enough to let us use his 3D printer, thus cutting our printing cost
- & With help from both of them, we were able to complete our product while staying under budget
- & The surplus was used on food/drinks for this presentation

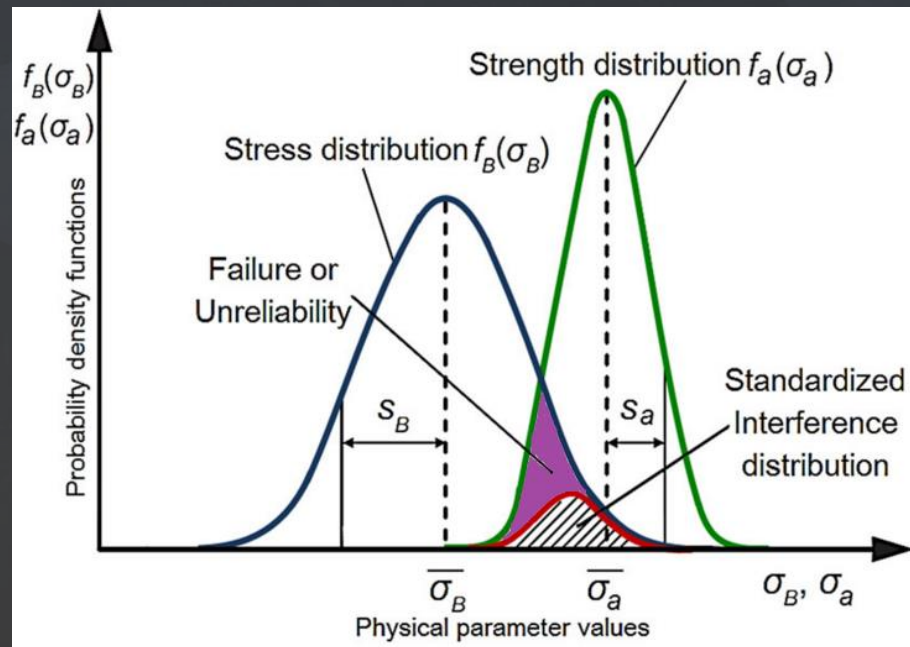
Budget

& Stuff

Item Name	Project Costs	Actual Costs	Difference
RFID Reader Base/Chip (13.56 MHz)	\$25	\$4 x 3	- \$13
Additional RFID Tags (~5)	\$3 / each	\$3	- \$12
Arduino Nano	\$45	\$10 x 3	- \$15
Electrical components	\$10	\$12	+\$2
Housing Unit	\$25	\$9 x 4	+\$11
Contingency (15%)	\$18	\$20	+\$2
Grand Total	\$138	\$113 for 4 units	- \$25

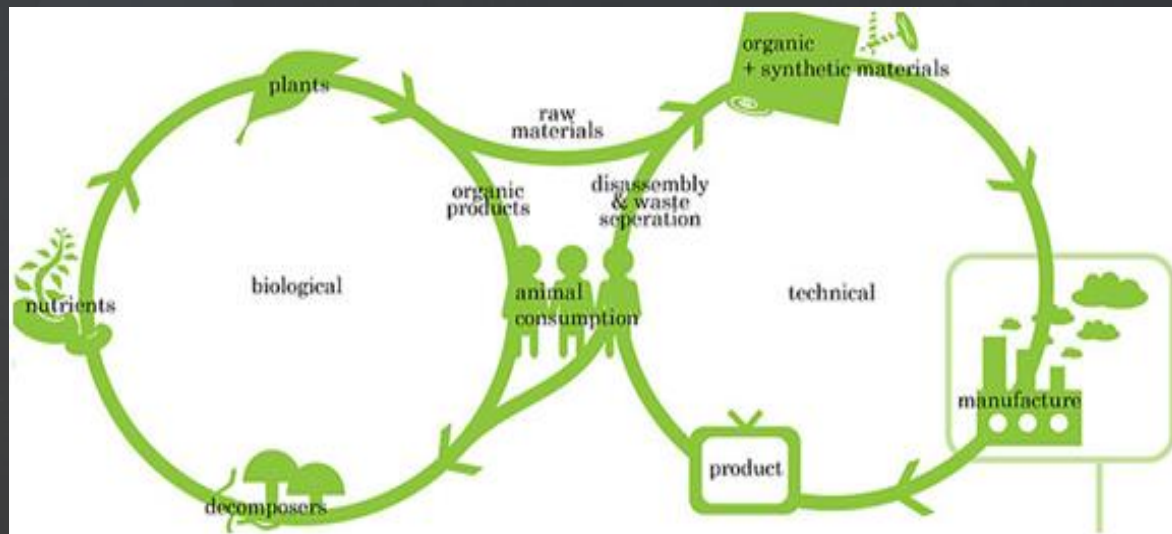
Reliability

- Failure testing must be performed to ensure a safe & dependable unit
- Load versus resistance will be analyzed to produce a unit that has less than 0.1 probability of failure



Sustainability

- ⌘ Environmental sustainability is an issue we take very seriously & that is reflected in our design
- ⌘ Using a 3D printer to house all our electrical & hardware components
- ⌘ Thermoplastic polymer material used by the printer can be re-used after a printing



Future Endeavours

- & Create an Android App that will replace the need for the for the physical unit
- & New generation Android phones have built in RFID reader, use that to read the cards
- & Can be even more portable & eliminates the need for a computer
- & Order all material in bulk & acquire venture or angel capital from interested parties

Business Case

STARTUP DEVELOPMENT PHASES



Ideation

Entrepreneurial ambition and/or potential scalable product or service idea for a big enough target market. Initial business idea on why and how it would create value. One person or a vague team; no confirmed commitment or no right balance of skills in the team structure yet.

Concepting

Defining mission and vision with initial strategy and key milestones defined for at least next 3 years on how to get there, -> 3, 6, 12, 24, 36 months. Two or three entrepreneurial core co-founders with complementary skills and balanced ownership plan. Maybe have extended team members for additional roles & ownership.

Commitment

Committed and balanced co-founding team with shared vision and attitude. Able to develop the product or service (Minimum Viable Product) without dependency of uncommitted external resources, or already have initial product or service in place. Shareholder agreement signed between co-founders, including milestones, committed time and money use, for minimum 3 years with vesting terms.

Validation

Iterating, validating assumptions until have validated solution to demonstrate initial user growth and/or revenue. Key Performance Indicators (KPI's) identified. Can start to attract additional investment based resources (money or sweat equity) for equity, revenue share or future revenue.

Scaling

Focus on growth, showing KPI's based measurable, growth in user, customer revenue growth and/or market traction in a big or fast growing target market. Can and want to grow fast. May, will or have attracted significant funding or would be able to do so if wanted. Hiring, improving in quality and implementing processes

Establishing

Achieved great growth, that can be expected to continue. Easily attracts financial and people resources. Depending on vision, mission and commitments, will continue to grow and often tries to culturally continue "like a startup". Founders and/or investors make exit(s) or continue with the company.

Version 2.5

www.startupcommons.org

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Capstone Demo Eve

& Twas the night before



+



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&





Some
work
was
done!



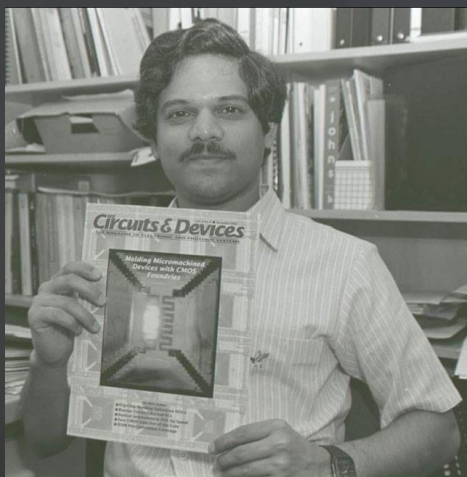
Testing in Lab 1

Summary

- & We offer a cost effective solution to attendance tracking & personnel documentation
- & Our system can read ID, barcode, & RFID, as well as take & record the user's picture
- & We plan on developing the accompanying app in January to assist with in-class exams
- & All this will be done via user friendly interface while keeping the cost at a minimum

Acknowledgments

- & Dr. Andrew Rawicz & Mr. Steve Whitmore
- & All of the 440 TA's (Lukas, Jamal, Shaun, & Masha)
- & Our friends & family for their endless support
- & Dr. Wang from Lee's Electronics
- & Our sincere thanks to Dr. Ash Parameswaran



Questions

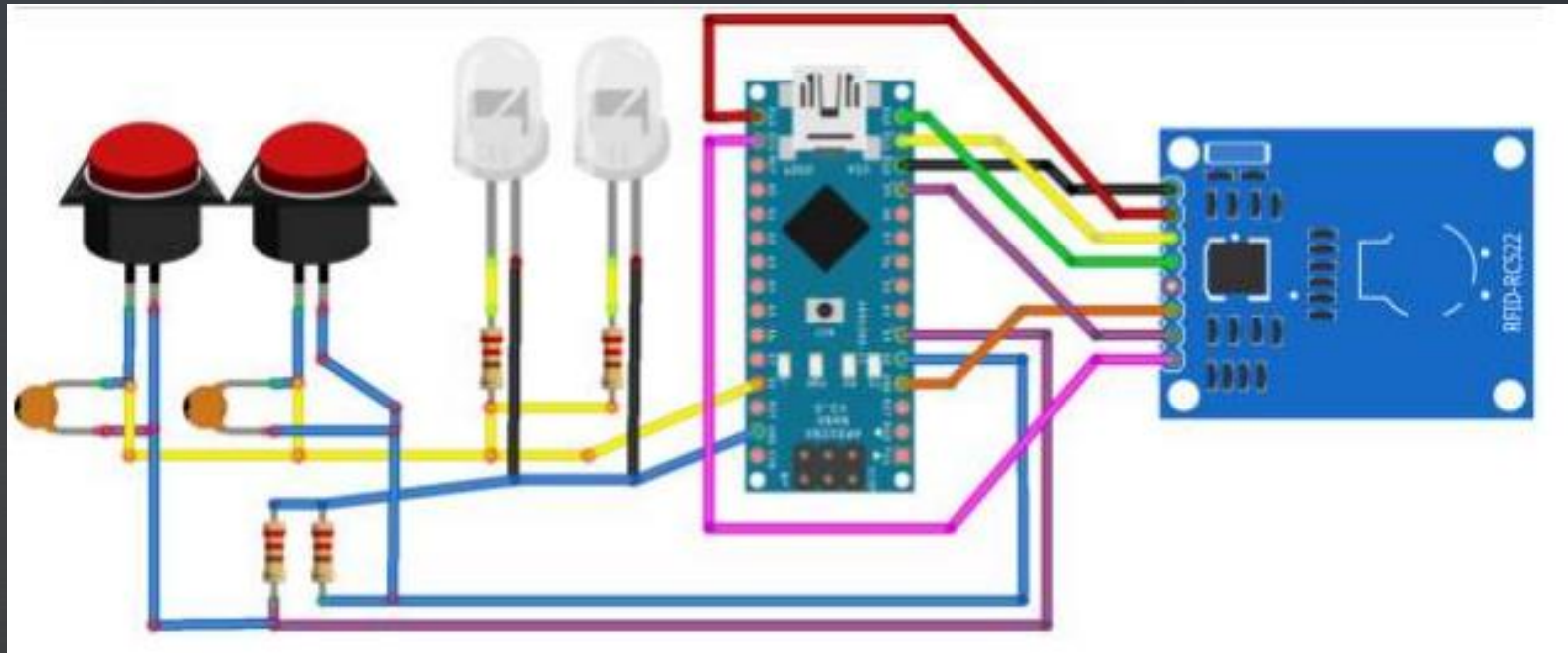
- & Thank you very much for your time today & for a wonderful semester
- & At this time we would like to open the floor for any questions



Image References

- ⌘ <http://kripaujjain.org/aboutus.php>
- ⌘ <http://www.234sixteentechnologies.com/about-us/>
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- ⌘ http://file.scirp.org/Html/1-8101536_9213.htm
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Appendix



Appendix

