

ENSC 440/305W

Hybrid e-Bike

4E Technology Inc.
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Team Members

- Jason Li (CEO) System Engineering
 - Overall regulation; the soul of team
- Sheng Sheng(CTO) Electric Engineering
 - Main technical for both hardware and software
- Yuanjie Zhang(COO) Electric Engineering
 - Task assignment to each member
- Coco Dong(CIO) System Engineering
 - Information collecting and market analyzing

Overview

- Background & Motivation
- Project Overview
 1. High-level description
 2. Propulsion System
 3. Generation System
 4. Control System
 5. Speedometer System
- Budget & Schedule
- Market
- Conclusion
- Reference

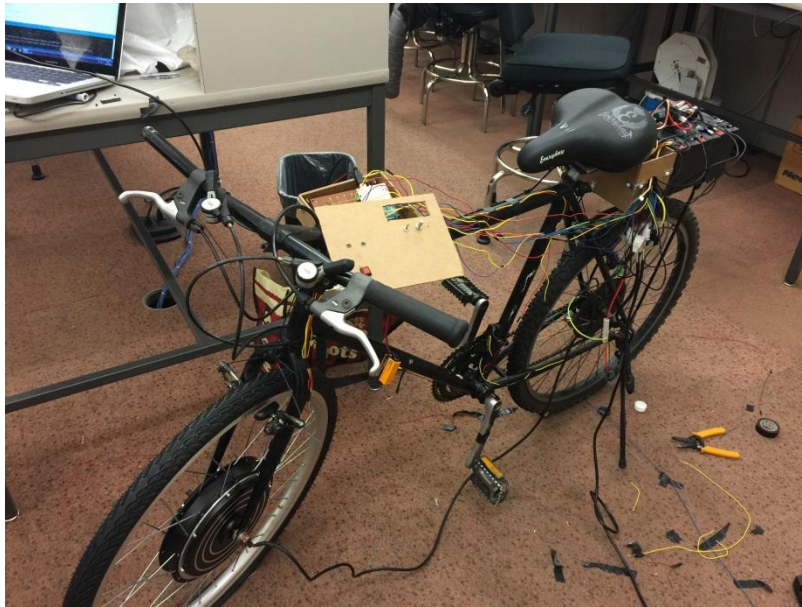
Background & Motivation

- Environmental issues generated by motor vehicles



Project Overview

- High-level description

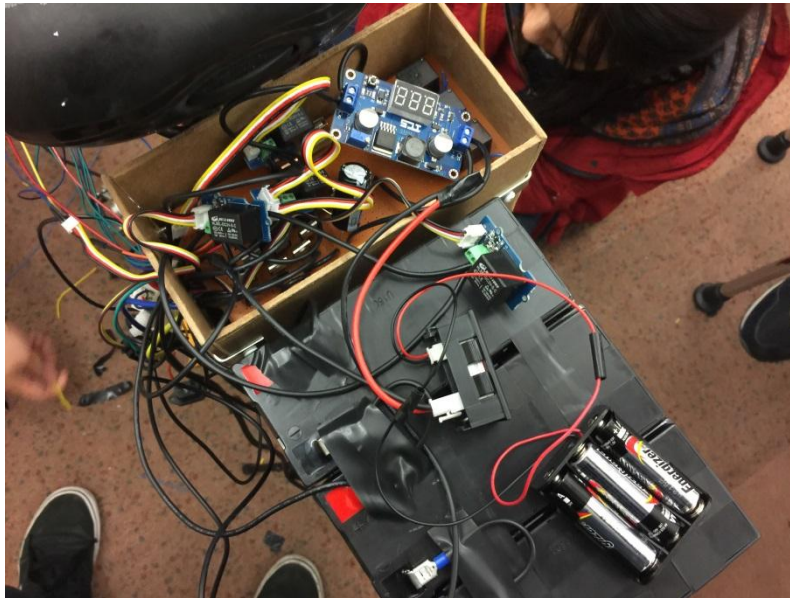


Project Overview



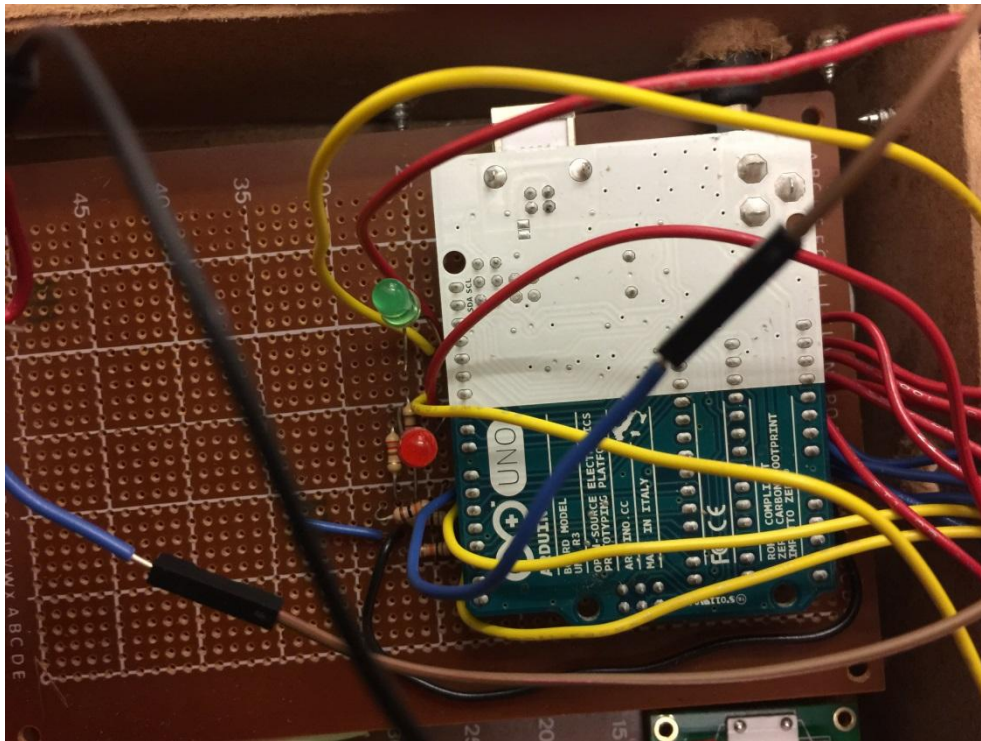
Project Overview

- Generation System



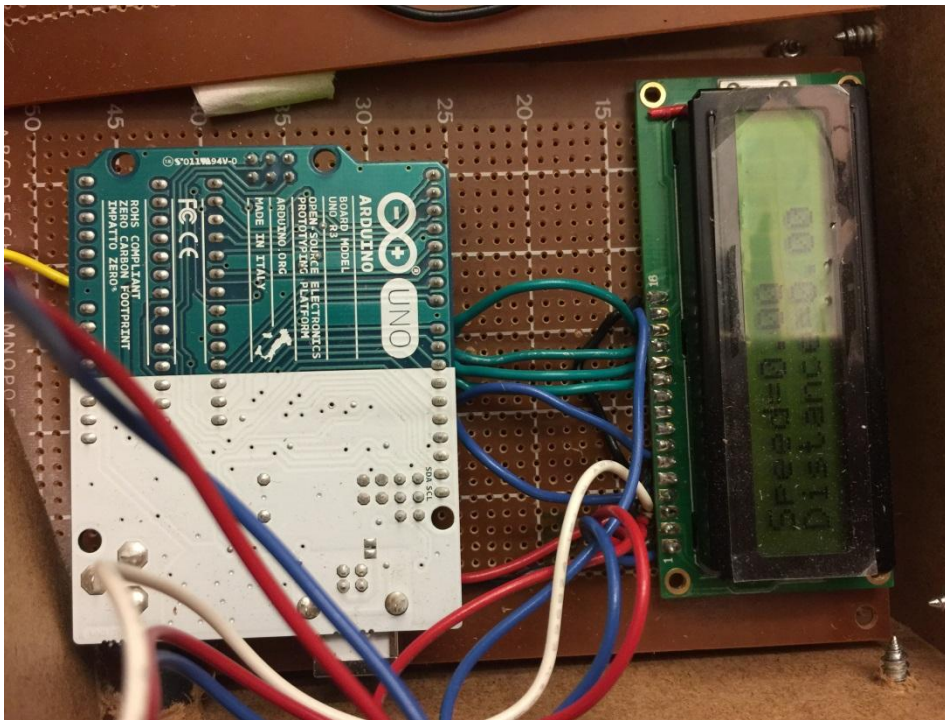
Project Overview

- Control System



Project Overview

- Speedometer System

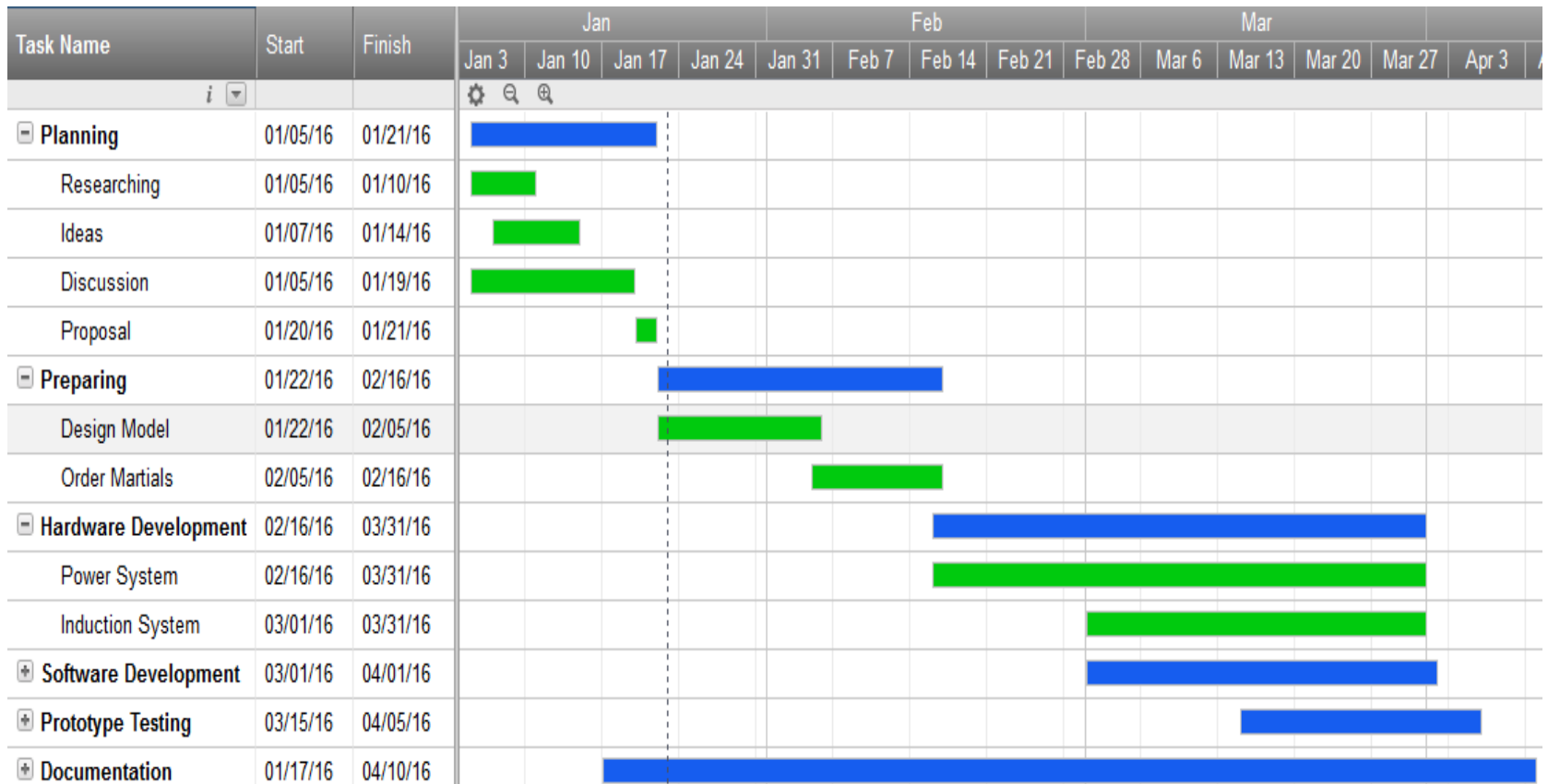


Budget & schedule

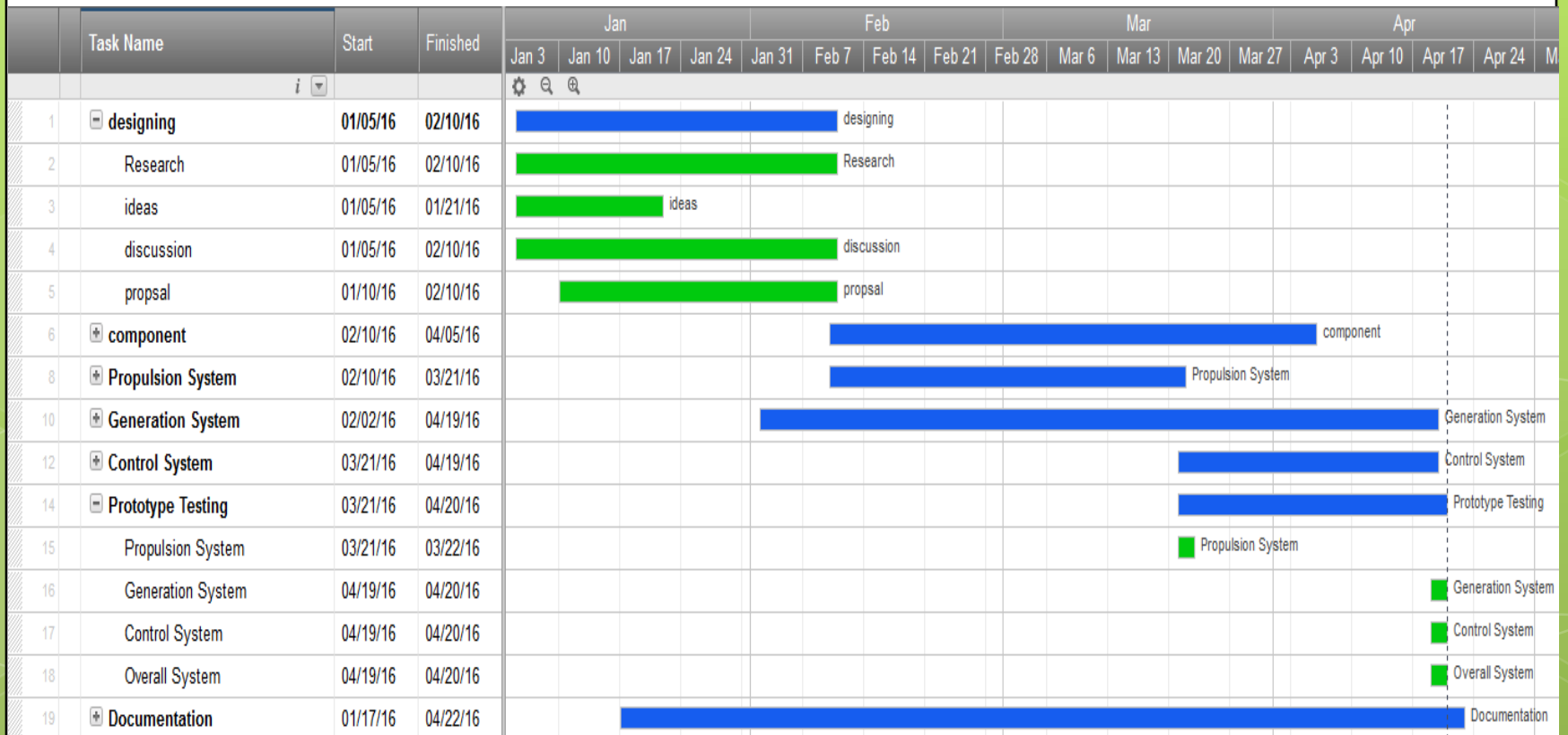
estimated Equipment	Quantities	estimated cost
used bicycle	1	\$100
48V battery	1	\$240
brushless hub motor	1	\$200
250W induction motor	1	\$200
26" wheel	2	\$163
battery monitor	1	\$20
bicycle back rack	1	\$20
electric throttle	1	\$15
position sensor	1	\$12
bicycle switch	1	\$6
Arduino (Uno R3)	1	\$5
LCD for Arduino	1	\$5
infrared sensor	1	\$3
PCB board	1	\$2
Total	15	\$991

Actual Equipment	Quantities	actual cost
26" wheel & BLDC motor	1	\$356
12V battery	3	\$80
6V battery	2	\$20
current meter	1	\$14
Voltage regular	1	\$22
bicycle back rack	1	\$20
Reed sensor	3	\$12
switches	4	\$12
Arduino (Uno R3)	2	\$42
LCD for Arduino	1	\$12
wires	4	\$18
Prototype boards	4	\$27
Total	26	\$625

Estimated Schedule



Actual Schedule



Market

- Just a few bicycle can generate by itself in the market.
- When the E-hybrid bicycle is 60km/h, it just need 1 hour to fully charge the batteries.
- The price is much lower than the regeneration bicycles



Troubleshooting

- Main problem: high current which is more than 10A for rush current. High voltage is 36V.
- It is so easy to burn some components if we connect the wire
- Other problems

Conclusion

- Hybrid e-bike is a multi-functional bike with a wonderful energy conversion system.
- Considerable market prospect
- Future improvements

Reference

- [1] Traffic pollution:
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- [2] Traffic jam:
<http://metro.co.uk/2015/10/08/travel-hell-for-chinese-motorists-stuck-in-50-lane-traffic-jam-5428193/>
- [3] BLDC motor:
[http://www.designworldonline.com/highly-dynamic-brushless-dc-motors/\[2012\]](http://www.designworldonline.com/highly-dynamic-brushless-dc-motors/[2012])
- [4] LCD display:
http://www.elecrow.com/wiki/index.php?title=File:16x2_Character_LCD_Display_Module_-_Yello1_01.jpg [2016]
- [5] Throttle:
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Questions ?