



NATCAR Design Review

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Bill of Materials

Status	Category	Manufacturer	Manufacturer Part No.	Datasheet Link	Vendor	Description	Vendor Part No.	Qty.	Unit Price	Total Price	Vendor Link	Primary Use	Notes
Unordered	Freescale Kit	Freescale Semiconductor Inc.			Freescale	Reused Freescale Kit		\$1.0000	\$120.00	\$120	http://www.freescale.com	Chassis, Motor	Reused
Unordered	Battery	DuraTrax			RC Planet	Power Kit with 7.2V Ni	DTXP4615	\$1.0000	\$19.99	\$19.99	http://www.rcplanet.com	Power	
Unordered	Camera	CMOS		http://cdn.sparkfun.com/datasheets/camera/728x488camera.pdf	Sparkfun	728*488 Camera Mod	SEN-11745	\$1.0000	\$31.95	\$31.95	https://www.sparkfun.com/products/11745	Line Sensing	
Unordered	MCU	Arduino	ATMega328P	https://www.arduino.cc/en/Main/arduinoBoardUno	Sparkfun	Arduino Uno R3	DEV-11021	\$1.0000	\$24.95	\$24.95	https://www.sparkfun.com/products/11021	Control	
						Lab Stock Fee							MOSFET, BJT, Wire, Resistor
									Total	\$196.89		Bonuses	\$0.00
									Remaining	\$28.11		AFE	\$0.00

Chassis, Motor & Servo

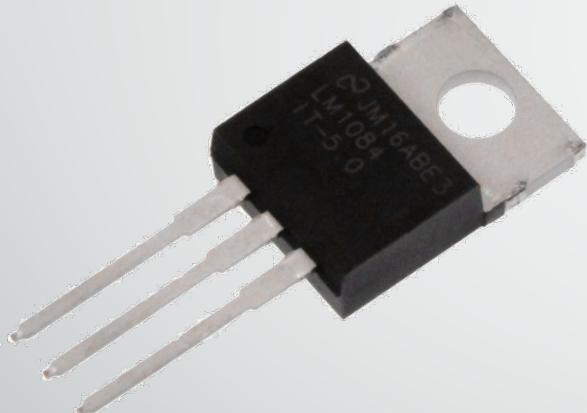
- Reuse Old Freescale Kit from last year
- Save our budget
- Don't have to assemble it on our own (Save time)

Battery



- DuraTrax Power Kit 1500 7.2V NiMH
- 7.2V gives enough voltage to power our motor and servo
- 1500 mAh provides enough battery life for competition and testing
- Rechargeable for longer use
- Tamiya (B3) plug is a common connector

Voltage Regulators

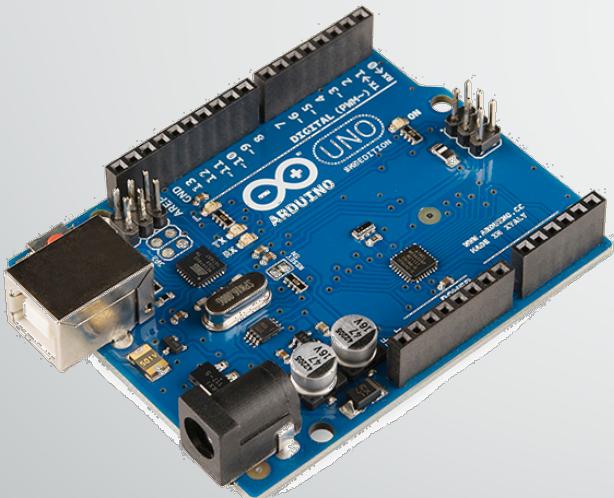


- 3.3V and 5V Voltage Regulator from IEEE lab stock
- Provides 5V voltage to power servo and motor
- Provides 3.3V voltage to power the gyroscope

Mounting

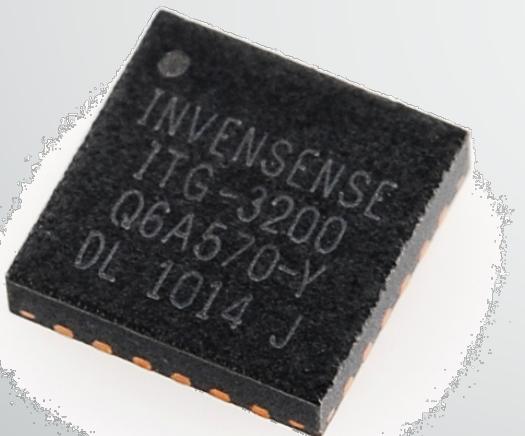
- Plastic material to reduce whole weight of the whole NATCAR
- Use screws and bolts as fasteners of the NATCAR
- Different shapes can be produced by IEEE's 3D Printer

MCU



- Arduino Uno R3
- Arduino is easy to program and has various resources online
- Larger Size but higher performance (compare to Arduino nano that used in previous labs)
- Can be fit on the Chassis

Extra Sensors (Gyroscope)



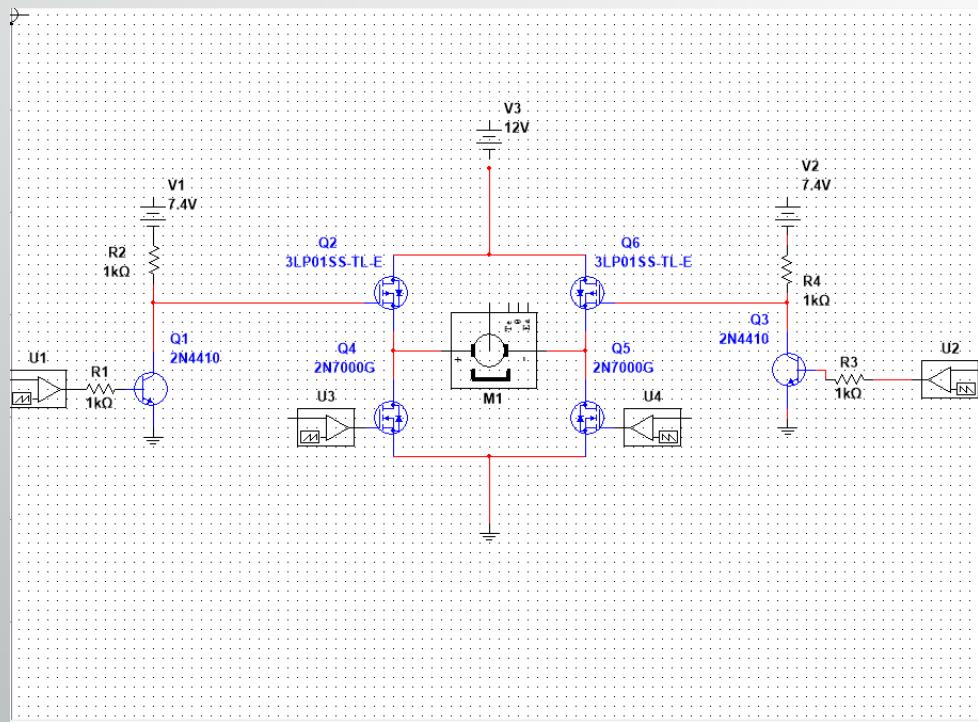
- Triple-Axis Digital-Output Gyroscope - ITG-3200
- Compatible with Arduino Uno chip
- Used to measure angular velocity

Camera



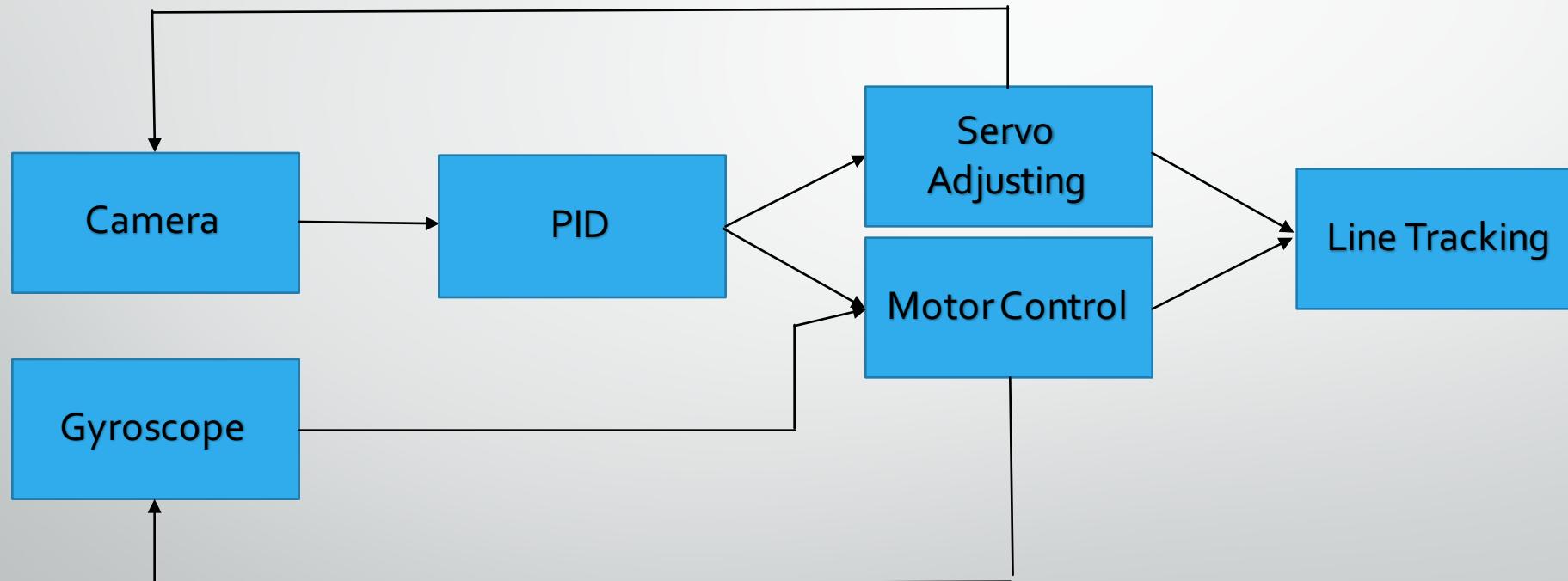
- Parallax Linescan Imaging Sensor TSL 1401
- Accurate imaging sensing
- Worked with this camera in previous lab

Motor Control



- H-Bridge used for NATCAR motor control
- Components from IEEE lab stock

Control System



Budget

Item	Price
Reuse Freescale Kit	\$120.00
Battery	\$19.99
Camera	\$49.99
MCU	\$24.95
Gyroscope	\$9.95
IEEE Lab Stock	\$20.00
	Total: \$224.88
	Remaining: \$0.12

Build Schedule

- Week 1~3: Assemble Hardware
- Week 4~5: Testing Hardware
- Week 6: Mounting
- Week 7: Overall Testing
- Week 8~10: Performance Improving



Thanks!

Credit to: Likai Wei