

AutonomousPrime

Order Proposal

Team Dec1721

Jones

Daniel Nugent - Integration

Rockie Brooks - Neural Network Architecture

Jens Petersen - Integration

Anne Tesar - Neural Network Architecture

Zach Bennett - Embedded

Brian Rye - Embedded

Email: **dec1721@iastate.edu**

Website: **<http://dec1721.sd.ece.iastate.edu>**

Revision: 3/6/2017

Parts List	3
Vehicle (Choose 1)	3
Minimum Requirements	3
Extra Requirements	3
Battery (Choose 1)	3
Minimum Requirements	4
Extra Requirements	4
Onboard Computer (Choose 1)	4
Minimum Requirements	4
Extra Requirements	4
Radio System (Choose 1 if required)	5
Minimum Requirements	5
Extra Requirements	5
Wireless (Choose 1)	5
Minimum Requirements	5
Camera (Choose 1)	6
Minimum Requirements	6
Extra Requirements	6
Camera Chart	7
Miscellaneous Parts	9
Proposal #1: Desired Parts List	10
Proposal #2: Backup Parts List	11

Parts List

Vehicle (Choose 1)

Minimum Requirements

- Large enough to hold onboard computer and camera(What does this mean in inches?)
- Good mounting point for hardware(Computers, bumpers, camera)
- Can buy replacement parts

Extra Requirements

Scale	Model	Cost	Condensed Link	Additional Requirements
1/16	Turnigy 1/16 4 x 4 Mini Trooper SCT (RTR)	\$102.78	https://goo.gl/fnpc2s	Battery (Ref #1) 4 x AAA batteries
1/16	Traxxas Slash 4X4 Performance in 1/16	\$199.95 (Amazon) \$215.99 (Traxxas)	https://goo.gl/Btftt8 https://goo.gl/du4f5G	4 "AA" for transmitter
1/10	Turnigy Trooper Pro Edition 4x4 Brushless SCT (ARR)	\$195.32	https://goo.gl/HzgpGH	Battery (Ref #3) Radio System (see next sections)
1/18	Dromida SC4.18BL Ready-to-Run Four-Wheel Drive Brushless	\$158.26	https://goo.gl/J3ecfy	Ready to Run

Battery (Choose 1)

Minimum Requirements

- Can power the vehicle
- Can fit in desired chassis

Extra Requirements

- Semi Long battery life(high mah) or multiple batteries

Ref. #	Model	Cost	Condensed Link	Additional Requirements
1	Turnigy nano-tech 2200mah 3S 45~90C Lipo Pack	\$20.98	https://goo.gl/tBvvBx	None
2	Turnigy nano-tech 1800mah 3S 25~50C Lipo Pack	\$16.50	https://goo.gl/QVjMBp	None
3	Turnigy 5000mAh 2S 7.4V 60C Hardcase Pack	\$27.06	https://goo.gl/UzseIW	None

Onboard Computer (Choose 1)

Minimum Requirements

- 3 USB ports
- Run the Neural Network in real time
- Not too big
- 5v power

Extra Requirements

-

Model	Cost	Condensed link	Additional Requirements
NVIDIA Jetson TX1	\$579.00	https://goo.gl/zRoX72	

Radio System (Choose 1 if required)

Minimum Requirements

- 3 Channels(Steering, Throttle, Kill Switch)

Extra Requirements

- 4 channels(Steering, Throttle, Kill Switch, Aux Switch)

Model	Cost	Condensed link	Additional Requirements
TrackStar D-Spec TS4G 2.4GHz 4-Channel Radio System (Gyro Integrated)	\$50.34	https://goo.gl/kZb9av	4xAA's or 2S LiPoly/LiFe Battery Pack for transmitter
Turnigy GTX3 AFHDS 2.4ghz 3 Channel Radio System	\$45.34	https://goo.gl/DeoxnT	12V DC (1.5AA x 8)

Wireless (Choose 1)

Minimum Requirements

- Usb interface

Model	Cost	Condensed link	Additional Requirements
TP-Link N150 Wireless Nano USB	\$9.61	https://goo.gl/2GmmKS	

Miscellaneous Parts

Model	Cost	Condensed Link	Additional Requirements
HDMI	\$6.99	https://goo.gl/Lv5hGZ	None

Camera (Choose 1)

Minimum Requirements

- Fast exposure
- UVC compatible
- Software Configurable: Exposure, Brightness, white balance, autofocus, contrast

Extra Requirements

- Interchangeable lens(Maybe min requirement)
- Global shutter
- Color
- USB 3.0

Model	Cost	Condensed link	Additional Requirements
Odroid -1MGN-U	\$126	https://goo.gl/zq7dLx	

Camera Chart

	logitech c920	Odroid - 5mp	Odroid -1MGN-U	See3CAM_10CUG - 1.3 MP	Black Fly	See3CAM_C U30 - 3.4 MP
Connection Type	usb 2.0	usb 3.0	usb 3.0	usb 3.0	usb 3.1/ethernet	usb 3.0
Field of view		65 degrees	65 degrees or less			
Max Resolution	1920 x 1080	> 1280 x 720	> 1280 x 720	1280 x 720	1280 x 1040	
Max FPS	60 when > 1280 x 720	30 @ 720p	60 fps	30 for stand. def	up to 175	60 @1080
Sensor Size(MP)	15	5		1.3	up to 7	3.4
Modes:	-	-	-	-	-	
bw					x	
color	x	x	x	x	x	x
Linux UVC	?	x	x	x	x	
Lens Mounting	N/A	M12	M12	M12	?	
Power	5v	5v	5v	5v	Depends on model	5v
Configurable options	brightness contrast saturation hue white_balance temperature sharpness exposure_absolute			Exposure control brightness control Still capture	Hopefully very configurable	3.4 MP still capture with Zero-lag-shutter
Supported video formats	H264, YUYV, MJPEG					
Shutter	Rolling	Rolling	Global	Global	Global	Rolling
Cost	\$59.87	\$96.00	\$126.00	\$89.00	\$300 - \$1000	\$75

Proposal #1: Desired Parts List

Quantity	Category	Model	Cost	Additional or notes
1	Vehicle	Turnigy 1/16 4 x 4 Mini Trooper SCT (RTR)	\$102.78	Battery (Ref #1) 4 x AAA batteries
1-3	Battery	Turnigy nano-tech 2200mah 3S 45~90C Lipo Pack	\$20.98	1 to power truck 1 to power TX1 1 as spare or increased runtime
1	Onboard Comp.	NVIDIA Jetson TX1	\$579.00	
1	Camera	Odroid -1MGN-U	\$126	
1	Wireless	TP-Link N150 Wireless Nano USB	\$9.61	
1	Misc	HDMI	\$6.99	None
--	--	--	--	--
:		Grand Total (max quantity and before shipping)	\$887.32	

Proposal #2: Backup Parts List

Quantity	Category	Model	Cost	Additional or notes
1	Vehicle	Traxxas Slash 4X4 Performance in 1/16	\$199.95 (Amazon) \$215.99 (Traxxas)	4 "AA" for transmitter
1-2	Battery	Turnigy 5000mAh 2S 7.4V 60C Hardcase Pack	\$27.06	1 to power truck 1 to power TX1
1	Onboard Comp.	NVIDIA Jetson TX1	\$579.00	
1	Camera	Odroid -1MGN-U	\$126	
1	Wireless	TP-Link N150 Wireless Nano USB	\$9.61	
1	Misc	HDMI	\$6.99	None
--	--	--	--	--
:		Grand Total (max quantity and before shipping)	\$975.67	