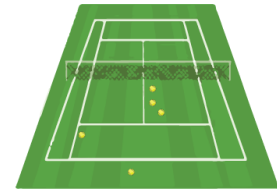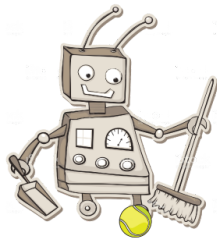# CLEAN COURT
Tennis Ball Retriever

Ideas for the Senior Design Clean Court tennis ball retriever project.

Availability to meet for meetings(times listed are times I'm available). I believe our meetings should be 90 minutes to 120 minutes so that we can get some quality work done.
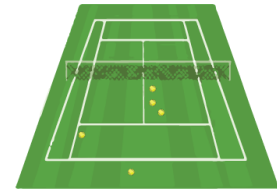
Name	Monday	Tuesday	Wednesday	Thursday	Friday	Weekends
Paul	All day I'm available and eve.	After 7pm	After 10am til night.	After 7pm	All day.	Usually after 7pm
Phil						
Tom	After 7:00pm	After 12:00pm	After 7:00pm	After 12:00pm	After 7:00PM	Anytime
Jake	Noon to 5:30 PM	2:45-5 PM	Noon to 5:30 PM	2:45-5 PM	Noon to 5:30 pm	10 AM to 5:30 PM
Justin						
Gwen						

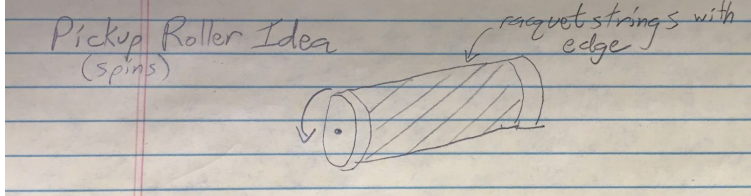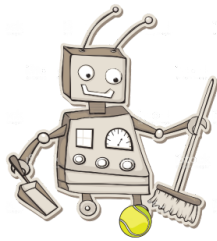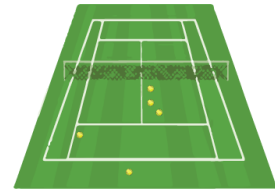| Topic	Comments
Robot Ideas:	- PixyCam Toy Following Robot - huge step in right direction - Top 10 Arduino Projects of 2017 - LEGO Mindstorm kit in AI grad office, see Roby Velez - Robot w Rasp Pi find home with OpenCV - https://github.com/rbakx/DFRobot - OpenCV Python Neural Network Autonomous RC Car - https://github.com/hamuchiwa/AutoRCCar - Building your first neural network self driving car in Python - RC car chassis with tank tracks

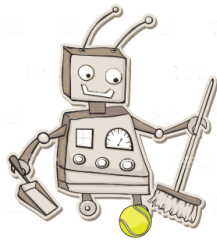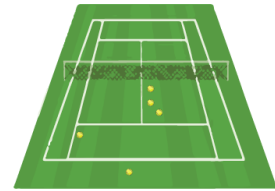|	
	- https://diyrobocars.com/ - Pixy (camera for doing simple object recognition - **PURCHASED**) - Wireless Motor Driver Shield - H-Bridge Motor Driver 1A (for controlling stepper motors) - PiZero or Pi 3 for onboard processing and communication. - Battery for Raspberry Pi - Wireless Joystick Kit w/ Xbee - GPS Mouse - GP-808G Hookup Guide - Intro Video - I found this Lidar unit (Scanse Sweep) kind of pricey but I tend to look at the most expensive options and go down from there. - Here's a more affordable unit (Lidar-Lite Cheaper) - Lidar-LiteV3 Hookup Guide - plus a video: talking about it's basic use: Adventures in Science: LIDAR - ReconBot with Tessel 2 - Sample Price sheet for an autonomous vehicle - SparkFun Autonomous Vehicle Competition - Picker-upper-thingy - Use ABEC 6 roller blade bearings like those found in a fidget spinner for the ends. It'd be nice to have something that spun freely with lots of rotational inertia.
Software Ideas:	- OpenCV for Python Developers Currently learning OpenCV to try and detect one tennis ball in an image. - Robot Operating System - ROS tutorial #1 - GAZEBO - Robot Simulation made easy - TensorFlow - Machine Learning library

CLEAN COURT
Tennis Ball Retriever

AI ideas	[Arduino and AI](#) [TRAIN YOUR OWN OPENCV HAAR CLASSIFIER](#) [Autonomous Self-Learning Robot (Q-Learning)](#) [Particle Filtering for Simultaneous Localization and Mapping(SLAM)](#) - Dynamic Bayes Nets (Pac Man game with 2 ghosts) - Removing AI from solving the picking the ball up problem and solving it mechanically. We could involve AI but using a robot Arm picking up the ball. You would focus on inverse kinematics, moving an arm to a specific location, the exact location of the ball in the image becomes really important, then you would want the 3D coordinates.

Elevator Pitch -draft
Elevator Pitch -draft(continued)
See it at:
https://flipgrid.com/5de6ff
 	
Well done promo vid [BoxLock Home](#)
	Problem: picking up balls wastes time and hurts back
	Who: Tennis players
	Tip: Avoid Jargon
	Hey tennis players! Do you want to get better at your game? How would you like to spend more time on your stroke and less time picking up balls?
	    Let me introduce you to the idea of **BallSpot** the tennis ball bot.
	    BallSpot is a self-guided robot that picks up tennis balls.
	    BallSpot will locate the balls on one or both sides of the court and return them to you or a set location.
	This will save you time that you can use for getting a drink and discussing technique with friends and family. It is also better for your back not having to pick up all those balls and you can spend more time getting better.
	    Isn't it time for **BallSpot**?

Team Member Name:	Expertise/Interest so far	Working On	Problems

CLEAN COURT
Tennis Ball Retriever

Phil			
Justin	Robotic RC car		
Tom			
Paul	OpenCV AI Arduino	Scribbler, Calico, Blob detection, python	How in the hell are we going to pick up tennis balls?
Gwen	Lego Mindstorms([video](#))		
Jake	Lego Mindstorms		

Team Members:
Phil Scott (pscott4@uwyo.edu) (James's brother) |
Justin Nason (jnason@uwyo.edu) |
Tom Davis(tdavis30@uwyo.edu) |
Paul Fechtmeister(paulfecht@hotmail.com) | (307) 287-9510
Gwen Brewer (gbrewer1@uwyo.edu | (307) 399-4527
Jake Sanderlin (cobnilrednas@gmail.com)
Just the emails good for copying and pasting into a group list in your favorite email client:
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tdavis30@uwyo.edu
gbrewer1@uwyo.edu
cobnilrednas@gmail.com
jnason@uwyo.edu

Today(11-13-2017) Jake and I(Gwen) built the basic bot example from the Lego Mindstorms kit and tested its color sensor. It does not work well at all, it only senses things that are a few centimeters away from it, we literally had to hold colored balls right next to it to get it to detect things, and it would detect yellowish things too, like skin tones and pale yellow-green. Additionally the "programming" that is included with it is pretty imprecise and simplistic. If we were going to use Mindstorms we would probably
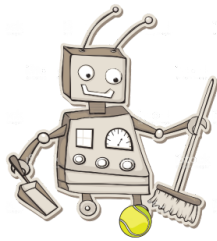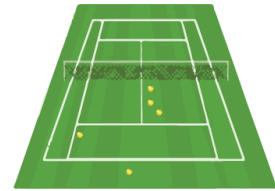
need to interact with it via an API.

Ok, at least you got something to work...and are learning… baby steps…. They do make a Pixy Cam for the Mindstorms, I gather that the included sensors are pretty basic. Does it have motors and could we possibly drive it around if you had a remote control and/or a camera on it?(11-13-2017) - paul

Yeah it has motors and it has a bluetooth capability that I guess we could use to send commands to it, we did not get to test the bluetooth because my laptop does not have that capability. Here is a video of us using the color sensor:
https://youtu.be/94D7dVNIpFY
Lemme know if you can see it or not, this is the first Youtube vid I ever uploaded and I made it "unlisted" Think you can view it that way. (I CAN SEE IT NO PROBLEM --paul)

Looks useful: OpenCV Python Neural Network Autonomous RC Car (see github repo in above links)