LEGO Automatic Turret

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Start Date: January 20th, 2014 **End Date:** April 7th, 2014

Goal:

Create a working sentry gun in which is able to aim in X and Y axis. This turret will be able to sense targets from X meters away due to a PIR sensor installed onto the turret. It will also be remote controlled in which frees the user from using the computer to guide the turret.

Timetable of Tasks:

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| Week | Activity |
| 3 – Jan 20, 2014 | Order missing elements. Research Python language and required BrickPi libraries. |
| 4 – Jan 27, 2014 | Start design of the turret. Test ordered parts. |
| 5 – Feb 3, 2014 | Status Report #1 – progress to date.  Build turret to design specs. |
| 6 – Feb 10, 2014 | Start coding the movement and the shooting mechanism. |
| X – Feb 17, 2014 | Reading Week, no classes.  Continue with coding core pieces. |
| 7 – Feb 24, 2014 | Research PIR sensor and start to code automatic mode using the PIR sensor. |
| 8 – Mar 3, 2014 | Status Report #2 – progress to date.  Continue coding automatic mode. |
| 9– Mar 10, 2014 | Research remote controllers to use with Raspberry Pi |
| 10 – Mar 17, 2014 | Implement manual mode utilizing a remote controller. |
| 11 – Mar 24, 2014 | Final polish of design and code. |
| 12 – Mar 31, 2014 | Status Report #3 - progress to date. |
| 13 – April 7, 2014 | Physical project complete, completion of report and presentation. |
| 14 – April 14, 2014 | Project Presentation to CNT and the English department. |
| 15 – April 21, 2014 | Project report complete and handed in for grading at the start of the week. |

What to do:

* Obtain basic Python knowledge.
* Obtain additional LEGO pieces.
* Obtain PIR Sensor.
* Obtain and achieve a design in which supports three motors.
* Obtain a remote controller.

Acquired Resources:

* Brick Pi
* Raspberry Pi
* LEGO Mindstorms NXT 2.0
* LEGO Digital Designer
* Laptop / Computer with internet access
* Brick Pi code and modules : <https://github.com/DexterInd/BrickPi_Python>
* Github

Potential Risks and Solutions:

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| Risks | Solution |
| PIR Sensor did not arrive. | Buy PIR Sensor locally at active123. |
| Raspberry Pi is broken. | Buy Raspberry Pi locally at active123. |
| **Brick Pi is broken.** | Buy another BrickPI online. Delivery time is about 2-3 weeks. |
| Insufficient LEGO parts. | Buy them locally or online at bricklink. |
| Remote controller did not arrive. | Scrap the idea or buy it again. |
| Design not achieved. | Spend 1-2 more days getting the design worked out. |
| **Complete design was broken obtain arrival of presentation.** | Bring box of LEGOs and design 3-4 days before presentation in pieces. |
| **Motors do not work.** | Buy motors through bricklink. ~$25 each motor. |
| **Github is down.** | Wait for Github or switch to SVN. |
| **Raspberry Pi’s SD Card is corrupted.** | Reformat SD card within 5 hours. |
| USB is corrupted. | Buy another USB or switch to Github or SVN. |
| **No internet access.** | Go to a place that has free wifi. |
| **Computer / Laptop are broken.** | Reformat, or complete project at NAIT. |