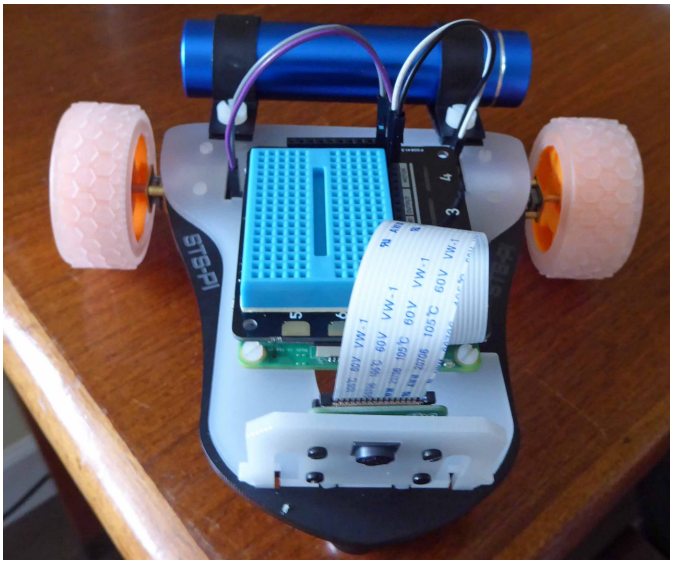
What a frustrating and useless week this has been. Oh grasshopper, it is only useless if you did not learn from it. Yeh, you can take that philosophy and stick it where the sun don't shine.

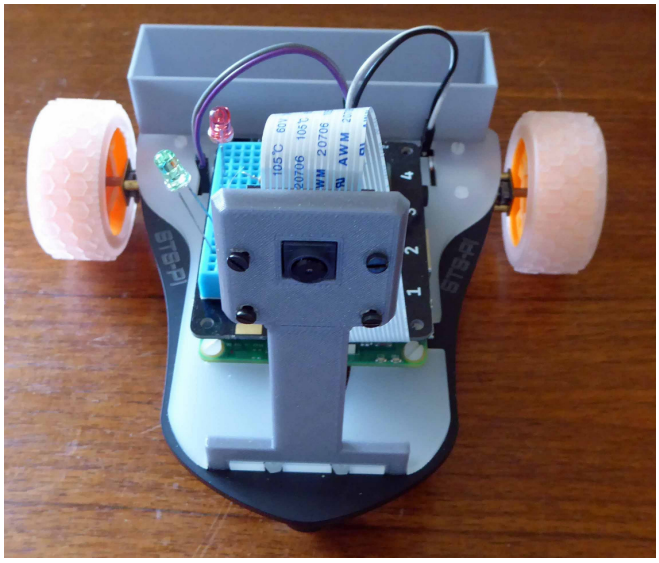
When I was going to university, taking computing science at a time that the computers were big enough that their heat could keep a whole campus warm, I worked evenings at the computing science library. Officially my job was to direct students/profs to the appropriate reference material. In reality, it was to help students with their programming problems. They would come in and say "my program does not work anymore and I did not change anything". My response would be "then why did you run it again, you could always photocopy the results". Eventually the student would admit that maybe they changed one thing.

Well Petro, the 3D printer, was doing wonderful, until it was not. I threw a hissy fit (middle of treatments), and submitted a problem report to Prusa. After the back and forth emails, I remembered that I had upgraded the firmware. (Firmware is the base code on computers that then allows the computer to accomplish basic stuff and also read other programs so that it will do the stuff you told it to do). It appears that the basic 3D printer software expects that the printer is using a smooth sheet bed to print on. This was true in the past, but now the printers ship with a textured sheet bed for better adhesion, which is of course not the same thickness. Remember that the extruder is flying over the bed at an1mm height, one-half the height of a raw kernel of rice. Since the melted filament is only 0.2mm thick, the sheet height difference is big. One motor is moving the extruder X-axis (left right), anther motor is moving the bed Y-axis (front back) and two motors are moving the extruder Z-axis (up-down). This is happening simultaneously. After re calibrating the Z (height) axis, magically things began to work again.

By the time that I would finish my evening at the library, there was no more bus service so I would have to walk the three miles home. Being in Calgary, it is a dry cold and no problem for those coming from the cold damp east. Ha ha ha. No sympathy from my father "when I went to school, we had to walk uphill both ways". I think this was when the flat earth society talked about the earth being on a teeter totter. Home being lower than school in the morning and higher than school in the evening. That group was replaced by the people who ran the elevators. You would get on an empty elevator on the third floor and say "fifth floor please". The response from the elevator operator would be " I am going down". You would then go down to the basement level and then back up to the fifth floor.

As a child, at Christmas, we would get one present and the remainder would be socks, new school tie, etc. Remember in the last report that the robots wanted longer arms, new hairdo and a pony. Wishful thinking. First on the list are battery holders which will hold 5v batteries versus a series of 1.2v ones resulting in three times battery power (amps). Next comes extensions to the camera holders so that you see less floor and more walls.





You will notice that all my 3D pieces are either flat or have 90 degree angles. It has something to do with gravity. It is hard for a 215C degree piece of filament to be suspended in air. Take a bottle of ketchup/mustard/ toothpaste where the width of the output is about the same as a tine on a fork. Create a base, about the size of a postage stamp. Now add a second layer that is slightly larger than the base. Continue with third layer. Attempt to create an upside down pyramid. Not much luck? What can be done is building vertical supports and then applying layer X to be supported by the support.

Allies pony is a big problem unless I take artistic licence and only create a silhouette or a boxy trojan horse. I thought about designing the pony and then cut length wise and lay cut side down. However, a pony legs are on the outside and would have to be supported. Version X would not have the legs, just holes and then print the legs separate vertically. Even simpler would be to buy a moulded pony. If Pedro says nothing to Allie, I will not. Next time I will not ask a general question, but “which one of the following four items would you like?” The pony idea will go on a back burner for now.

On the software side of things, there is a web site that I have used periodically when I programming the camera. The author of this site is increasingly talking about Artificial Intelligence (AI) and different tool kits to use. They had a sale last month of 33% off instruction books, software and if you purchased the hackers kit, you received life time upgrades to everything. I went for the whole kitchen sink. I now have 1300 pages of manuals to read. I have definitely blown my yearly budget. The hackers kit also gets one access to a wealth of tutorials and an user forum to discuss many different topics.

On the hardware side, I have a half baked idea/design for a robot with front turning wheels. I would disassemble Hobbie, the first robot we built, as it has the Arduino board to handle the most motors. Some of the remaining questions include:
- one or two wheels in front
- front wheels motorized for power or just for turning a gear to turn the wheel(s)
- back wheels non-motorized, one motor for both wheels or one motor for each wheel.
- what type of filament to use to build the gears. Everything so far has been polylactic acid (PLA) but it can be brittle. Polyethylene Terephthalate Glycol (PETG) is stronger but I have not used it and do not know the tricks to use it