

Robotics II Lessons for 23-28 March 2020

As you have seen from dealing with the Arduinos, they can process both analog and digital signals. Reviewing, light sensors and potentiometers produce varying voltages, or analog signals.

When we used the temperature and humidity sensors, their output was a digital signal.

The following videos will cover some basics in review of the differences between analog and digital signals.

What is Analog and Digital <https://www.youtube.com/watch?v=j7-acuTio4M>

Analog vs. Digital Sensors <https://www.youtube.com/watch?v=Z3rsO912e3I>

Analog to Digital Converters https://www.youtube.com/watch?v=Sh4pI_kBNkk

I know the last video is long and complicated, but seeing some of these concepts will be useful as we progress to other microcontrollers, like the Raspberry Pi. The Pi is actually a microcomputer that has digital input and output pins that allow us to connect to sensors and actuators. But the Pi does not have analog pins. Can you find analog to digital converters on the internet? Try Amazon first, then places like Adafruit, SainSmart....there are many more out there. Notice what kind of output they give. If this doesn't ring a bell with what we covered in January, the next set of videos should refresh your memory. Now, if we need an analog to digital converter right now, with only the components you have seen in class, what can we use?

Serial Communication Protocols <https://www.youtube.com/watch?v=lyGwvGzrqp8>

Now, do you remember covering data transfer busses?

These last videos look at how the actual data is put onto wires and received by another device. This is actually happening on the Arduino and Pi boards between the instigated circuit chips and all the way from digital sensors to the display.

Reliable Data Transmission <https://www.youtube.com/watch?v=eq5YpKHJDM>

Checksums and Hamming Distance <https://www.youtube.com/watch?v=MgkhrBSjhag&t=512s>

I'm not sure if we can play with examples when we come back to school, but it helps to understand why selection of the right protocol is important and where errors can come from.

Hope to see you soon!!

Mr. C