Overview of Raspberry Pi computer and PLATO Raspberry Pi for Tinkerers course

The class will be designed to appeal to tinkerers and experimenters. We will explore input and output of these single board computers and add wires and software to extend their functionality. Example projects might be for audio or video capture, robotics, communications, environmental sensing, home automation, or a wide variety of other areas.

Background: The Raspberry Pi, first produced in 2012, now refers to a group of small and inexpensive computers developed by the Raspberry Pi Foundation*. Currently there are probably twelve different models for sale, with five being the most current and popular. The others are continuations of older models. The current ones are the model 4, available with 1, 2, 4 or 8GB of memory, the Zero, with or without WiFi, model 400, which is a 4GB model 4 enclosed within a keyboard, the compute module, and the Pico microprocessor board. See https://en.wikipedia.org/wiki/Raspberry_Pi for more information.

Class members will need to obtain a Raspberry Pi computer by the third week of the class. It is recommended that it be a Model 4, 400 or a Zero W (WiFi). Older boards, back to a Model A or B would work. A Pi will need a power supply, cables, SD card, keyboard, mouse, and monitor to be fully functional. Vendors commonly combine everything except the monitor, keyboard and mouse as an integrated package - Raspberry Pi 4 S"starter Kit" prices range up from $84.99 on Amazon. The different models, potential vendors and price points will be discussed in the first class.

Below is a photo of the two Pi models that will be the used for the primary focus in the class. On the left is a model 4 and on the right is a Zero W (WiFi). The covers have been removed from the cases for this photo. Both have aluminum heat sinks installed. At the left on each board there are 40 General Purpose Input Output (GPIO) pins that can be used for connecting wiring to a wide variety of sensors and input/output devices. The small blue board is a temperature-humidity-barometric pressure sensor connected to the Pi Zero. Both boards have Ethernet, WiFi, Bluetooth USB, power, camera, SD card slots and HDMI capability.

Below are images of the Raspberry Pi 400 packaged as a $100 kit and how the single board computer is embedded inside the keyboard, with GPIO, power, HDMI and power on the backside.

Another Pi board is the Pico, using the name for metric unit one-trillionth. The main chip on this board is a microcontroller board and not a microprocessor CPU. This is the newest board from the Raspberry Pi Foundation and has a list price of $5.00, without pins. These are a lot of fun to use and we will cover them toward the end of the class.
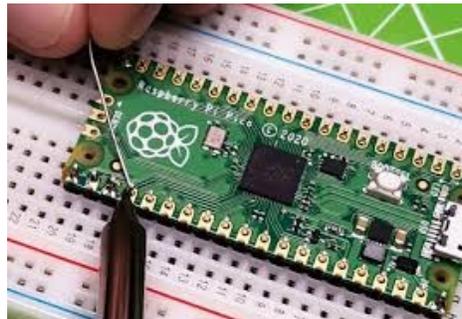
This class is designed for both beginners and experienced Pi users. Participants will receive basic instruction about setting up a Pi and ways of exploring potential projects. A basic interest in using computers to do things that are not automatically built in would be helpful.

This course will be taught by Al Nettleton, who was a systems architect at the Wisconsin State Laboratory of Hygiene, retiring in 2008. In addition to interest in Raspberry Pi computers, he is a avid reader, bicycle rider and traveler. In a former life he was a researcher, long-term graduate student and taught speech. Al and his wife now live at Capitol Lakes.

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*The Raspberry Pi Foundation reports that they are "a UK-based charity that works to put the power of computing and digital making into the hands of people all over the world. We do this so that more people are able to harness the power of computing and digital technologies for work, to solve problems that matter to them, and to express themselves creatively." See www.raspberrypi.org.