Intro to Hardware: Hackpack

September 17, 2021 / 10:00 PM - 11:30 PM ET

Description

Ever wondered how to prototype a robot, or wondered how motors are controlled? In this workshop, we will cover the basics of hardware prototyping with Arduino. We will learn to implement multiple circuits, such as controlling a servo motor with a potentiometer.

This workshop will be performed in a hybrid layout. Some hackers will have access to a physical hardware kit, and others will perform the workshop on a hardware simulator (Tinkercad).

Learning Outcomes

After this workshop, you will be able to:

- Prototype hardware circuits using a breadboard
- Write Arduino code to take external inputs and control a device

Prerequisite Knowledge

No prerequisite knowledge is required! However, to get the most out of the workshop, a basic understanding of C or C++ will make it easier to write the Arduino code.

Pre-Workshop Checklist

Before the workshop, please make sure you complete the following items:

- If you have a physical harkit, please download the Arduino IDE. Be prepared for a hands-on building!
- Optional: If you don't have a physical kit, get comfortable with dragging and dropping components and wires in Tinkercad Circuits. A tutorial is linked in the workshop resources.

Timeline (1 hour and 30 minutes)

Time	Module		Description
5 min	What is Arduino?		Cover the premise of Arduino and what it is used for.
10 min	Overview of Hardware Kit		Explain individual components in the physical hardware kit.
5 min	Overview of Arduino Code		Show what Arduino code looks like, in Tinkercad and the Arduino IDE.
15 min	Starter Example: Blinking an LED		Get comfortable with the hardware kit and tools by blinking an LED.
45 min	An interactive example	Servo Motor Control	Implement a circuit with a servo motor and write the code to move it.
		Servo Motor Control with Potentiometer	Add in a potentiometer into the circuit to control the servo motor.
5 min	Beyond the workshop		Serial input for the Arduino, more completed examples
5 min	Q&A		

Workshop Lead Contact

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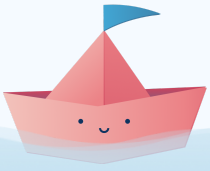

Additional Resources

Hack the North Resources

Hack the North 2021 Event Schedule

Check this out to stay up-to-date on activities, workshops, and other key happenings this weekend.

Workshop-Specific Resources

Slides

Link to slide deck for the workshop.

Tinkercad Circuits Tutorial

If you are working with the hardware simulator, feel free to get comfortable with Tinkercad Circuits.