

**Supercon 6  
Digikey  
Presents**

**TOGETHER  
IN  
ELECTRIC  
DREAMS**



**ADVERT**





**REALITY**



**REALITY**







**REALITY**



A close-up photograph of a person's hands working on an electronics project. The person is wearing a blue button-down shirt. Their left hand holds a soldering iron with a black and red handle, and their right hand holds a small blue printed circuit board (PCB) with various electronic components. They are in the process of soldering a component onto the PCB. On the wooden workbench, there are several other items: a breadboard with a blue PCB and orange and green jumper wires, a small black component, a blue component, and a yellow component. The background is blurred, showing a wooden surface and some other tools.

**WHAT ARE WE DOING HERE?**

# MICROPYTHON

A close-up photograph of a human finger, likely the index finger, with a small, slender snake coiled around it. The snake has a dark blue body with yellow and blue markings along its sides. The background is a blurred green, suggesting an outdoor setting.

Learning some basics of 'e-z-mode' microcontroller programming



# MIMICRY

A detailed photograph of a brown butterfly, likely a species of leaf butterfly, resting on a cluster of bright red flowers. The butterfly's wings are intricately patterned with brown, tan, and black markings, mimicking the appearance of a dried leaf. The background is a soft-focus field of similar red flowers, creating a vibrant contrast with the brown tones of the butterfly.


Generating  
ideas for our  
own personal  
companion



# MODULES

A close-up photograph showing a person's hand holding a small, black, rectangular digital sensor module. The module's LCD screen displays two readings: '26' on the left and '25.2 °C' on the top right, with a '%' symbol on the bottom right. A black cable extends from the right side of the module. In the background, a potted plant with green and white variegated leaves sits in a yellow pot. The scene is set on a light-colored, reflective surface.

Drive some  
servos and  
sensors and  
make them  
interact



Share knowledge and encouragement to ensure everyone in the group is equally confused.

**MUTUALISM**



**KNOWN TO THE STATE  
OF CALIFORNIA TO  
CONTAIN CHEMICALS**





# ACHTUNG!

A photograph of a young child in a blue puffer jacket and a cream-colored knit hat with a pom-pom, crouching on a paved path to feed several coypus (nutria). The child is holding a small red and blue object, possibly a whistle or a small toy, near their mouth. Several coypus are gathered around the child, some with their mouths open, waiting for food. One coypus in the foreground is holding a piece of food in its mouth. The background shows a body of water with some ducks and a shoreline with fallen leaves and some vegetation.

This is a low risk workshop, however:



# SAFETY THIRST!

Be careful about short circuits.

Any output can become a short and release magical smoke.

We are working with low voltage, so consequences are mild.

Double check power connections.

Beware loose wires

# SAFETY THIRST!

When cutting wire, hold both pieces of wire.

The loose end can fly and you'll take your eye out.



# SAFETY THIRST!

Scissors.

Be careful to not cut yourself.

Don't run with them.

# SAFETY THIRST!

Glue.

Do not huff.

Do not stick non-workshop things together.

Be nice to the Hackaday HQ.



**WE CAN REBUILD YOU**



**What does a  
companion look  
like?**

[https://www.instagram.com/odd\\_jayy/](https://www.instagram.com/odd_jayy/)





JORVON MOSS

## Robotic Designs

Jorvon [Odd-Jayy] Moss is an accomplished Maker best known for his Robotic Oddities. Jayy's art background, BFA in Illustration, and self-taught electronics skills have combined to help launch his career and promote the wonderful world of STEAM (Science, Technology, Engineering, Art, Math). This achievement, and the many viral videos under his belt, gained him recognition from major forces in the industry; including Digi-Key Electronics, Tested Inc. with Adam Savage, various electronic and tech Faires, and as the first Black person in Make Magazine (issue 76), garnering a spot in the Maker Museum.

This talk will explore the evolution of my companion robot including how I make them seem alive with movement and artificial intelligence.



LACM

Saturday, November 5, 2022  
4:30 PM





LACM

Saturday, November 5, 2022

4:30 PM

<http://www.alexglow.com/>



<https://www.hackster.io/glowascii>





<https://www.gellacraft.com/>







# Free Tinker

Grab paper and pen and think of ideas, especially if I'm covering stuff you already know.

What animal represents me?

Do I have a personal trait I would like to externalise and parody for self-improvement?

The Disney sidekick they should have made.

Social commentary personified.

# Workshop Dramatis Personae

OddJayy - Companion making powerhouse.

Nate - Coder and maker.

Kevin - Gently encouraging.

Dominic -

Paul - Workshop cat-herder and can google that for you.



# What hardware are we using?

Raspberry Pi Pico W

I2C breakouts (Qwiic, Stemma QT, Breakout Garden)

SPI display

Servos

Arts & Crafts materials

# Which firmware/software?

Pimoroni 'batteries included' MicroPython for Pico W

## **Breadcrumbs for later**

CircuitPython would also work (and supports a wider range of hardware)

Arduino works (official and community)

C(++) (Hard mode, most performance)

# Pico (W) Basic Survival Skills

**Already done:** Adding MP/CP/Arduino to a Pico/Pico W

BOOTSEL

flashnuke.uf2

Thonny is the ‘good enough’ way cross-platform

CircuitPython does the sensible ‘flash drive’ way

**Breadcrumbs for the extra-nerdy:**

mpremote.py and the other thing



# BLINK.PY

REPL and main.py

Invoke the basic IO stuff

Choose a pin/led to twiddle

Twiddle it

# **SPLIT INTO SMALL GROUPS**

There will be FOUR groups of up to FIVE peeps each.

Each group will have a complete set of stuff.

You will work together to make each bit work and understand it.

No geek left behind.

# Inputs

Let's connect stuff!

Sensors available: ToF, Accelerometer, Light, Touch, TODO



# Outputs

Let's make stuff blink and move!

Available: LCD, LED Matrix Haptic Buzzer, Servo, Continuous Servo

# Amoeba

We'll now hook a sensor up to an output to create a single-celled organism

A simple stimulus/response.

# FREE TIME

You have 20 mins to play around with your inputs and outputs. Can you make them more lifelike? Can you give them quirks to make them less mechanical and have an individual character.

Looks through the scripts on the device for inspiration.

If you get stuck, ask around your group, or grab a helper.

Maybe trade your surplus items with others to try new things!



# Moods

Now we have the basics of a sensory system, let's look at how we start making a more complex organism.

Let's create the concept of moods. Our little buddy can start having more complex responses to varying stimuli

# Idle

We don't just want a reactive creature. It should have some kind of internal life, so it's not just waiting for a stimulus to show signs of life.

# Emergent Behaviour

We've got the basic elements of a living organism now. From here, we start getting more creative, and adding finesse to the actions and emotions, to give them character.



# FREE TIME

You have 30 mins to play around with personality and appearance.

Add individuality and complexity to your companion (or limb/tail)

Your group and helpers will be here to help and inspire.









