SUSAN TRIPP POLLARD/STAFF PHOTOS

Michael Shiloh uses an Arduino appropriately named "Teeney" to create new things from recyclable objects in his workshop on Treasure Island.

Arduino technology makes it easy to inject creativity, interactivity into any project

By Laura Casey

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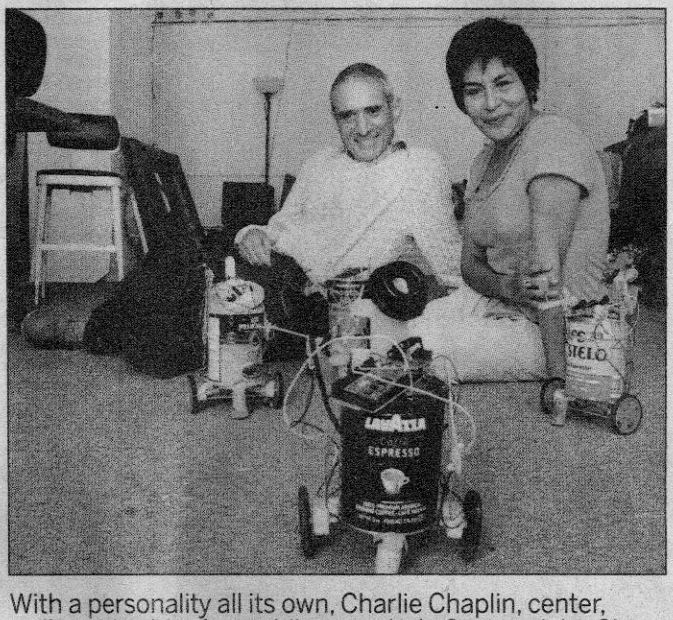
Judy Castro doesn't have a background in engineering. But with Arduino, she doesn't need one to make her sculptures move, light up or breathe fire. The San Francisco artist uses the microcontroller and software program to create interactive works of art — something she once might have paid an electrical engineer thousands of dollars to do.

Arduino, the 6-year-old, user-friendly microcontroller, is emerging as a powerful, popular tool for artists and others in the Do-It-Yourself community. Arduino can be as small as your pinkie finger and can cost less than $30, but it can light up a few LEDs for the beginning programmer or, with the help of amplifiers and mechanical parts, turn on a hydraulic ram that will lift tons, ignite a flamethrower or create a light show that can illuminate a stadium.

"When I started tinkering with Arduino, it was very easy to understand," she says. "It's actually a lot of fun to work with without being frustrating so you can focus on the aesthetics of your piece rather than the coding."

In addition to its low cost, Arduino's open source nature — which allows people to share their work — is moving the microcontroller out of the realm of hackers and artists and into the hands of hobbyists young and old, says Make Magazine Associate Publisher Dan Woods. Unlike other tools, he notes, Arduino wasn't made for geeks.

"They created it for artists and others who didn't have a background in programming. If someone has a project in mind, they can be up and running and doing something pretty basic in about an hour. They can see what a microcontroller does."



With a personality all its own, Charlie Chaplin, center, walks with a bit of a waddle, says Judy Castro, right. She and partner Shiloh, left, also agree that Carmen Miranda, right, moves with a bit of a shake.

For example, Castro and her Teach Me to Make partner and Arduino teacher Michael Shiloh made unsophisticated, movable robots out of tin cans using Arduino. While the robots also need motors to move the wheels and other parts and a battery for power, the Arduino software can be programmed to determine how fast they move, when they stop and how they turn. The Arduino board uses simple wiring to connect the lights and motors.

"Arduino has this magical combination of being simple enough that you don't have to be an electrical engineer to do it," Shiloh says, "but complicated enough where you can do very interesting things with it."

Although the name Arduino

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WHAT IS ...

Arduino: The name of both an open source microcontroller and an open source software program that allows artists and electronics-makers to easily activate objects.

Open Source: Software for which the original source code is made freely available and may be redistributed with or without modification. Can apply to hardware in Arduino's case.

Microcontroller: A small computer on a single integrated circuit containing a processor core, memory and programmable input/output peripherals. Used to program movable objects like lights and mechanics.

few put in high-tech vaults
injected with nanotrite ma
to preserve their life. They
world's best and brightest
were supposed to rebuild t
zation, but something wen
Over the course of the cam
players will have to discov
exactly changed the plan.

It's an intriguing story
took too long to set it up. T
spent so much time coming
with errands and tasks for
characters that the main c
failed to arrive until a third
the game. And don't get m
on the game's resolution.

At first, I didn't mind th
slow burn. I was too caugh
in "Rage's" impressive visu
Running on the new id Tec
engine, the game looks ast
in motion. It runs so smoot
like satin for your eyeballs.
even more impressive is th
add enemies and special ef
the detailed environment a
engine handles everything
a hiccup.

But the more I played "
the more I realized that id
strayed far from its first-p
shooter heritage. The bigg
the developer took was in
death. Players can run out
but still survive just as long
they complete a short mini
shows the nanotrites acting
built-in defibrillator, shock
ers for a second life.

The new wrinkle makes
game more forgiving and a
sible to those tackling an F
the first time. I just wish th
eliminated the save feature
renders the element moot.

Another corridor?

That's a minor quibble
pared with the bigger prob
I had with the shooter elen
— the level design. Save fo
missions, every scenario I
felt like a corridor shooter.
that id excels at these (it la
foundation for the genre) b
game ends up being monot
with the same narrow hall
small rooms and skirmishe
mission.

Sometimes I had to take
with a handful of diversion
disposal. Id did a good job
ing up with gambling distra
such as the collectible card

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