$30 Gets You the Sensor-Packed, Curie-Powered Arduino 101

By **David Scheltema** October 16th, 2015 3:15 am

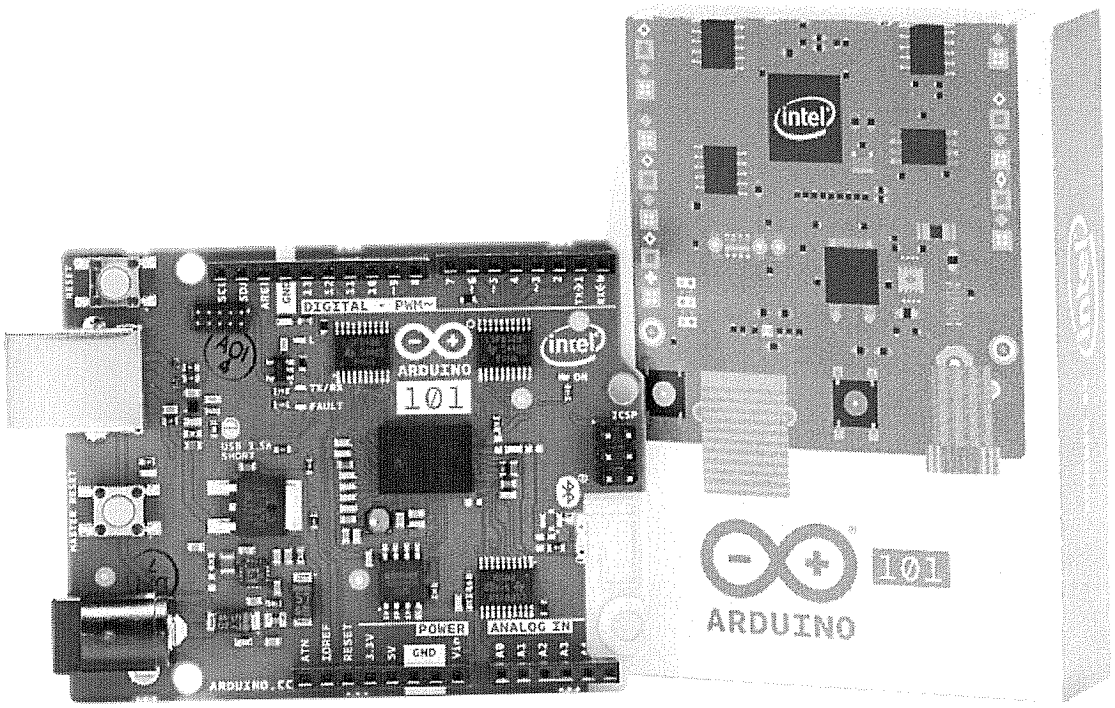
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ROME — Today at the Rome Maker Faire, Intel and Arduino are announcing a new board, the Arduino 101, powered by the Intel Curie module. It is scheduled to be available in the first quarter of 2016, at about $30.

(Outside of the U.S., Arduino is known as Genuino.)

Thanks to technology in the Curie, the Arduino 101 will have a 6-axis accelerometer with a gyroscope, and the hardware for Bluetooth wireless communication, in addition to the familiar input and output capabilities of the classic Arduino UNO.

Together, Intel and Arduino plan to use the cobranded board to promote their initiative, ***Arduino 101 in the Classroom***, a computer science and design curriculum aimed at educating 11–14 year old students in emerging technologies. The Arduino 101 will also be the hardware configuration of the Curie that contestants will use during Intel and Turner Broadcasting System's upcoming reality television show **America's Greatest Makers**.

ARDUINO 101

The Arduino 101 will look familiar to current Arduino users, as it retains the familiar 70mm×55mm×20mm form factor of the Arduino UNO. However, close inspection of the circuit board reveals an on-board antenna (note the bottom right corner on the image above) and a new main processor, a low-power, 32-bit Intel Quark microcontroller known as the Curie module. What differentiates this particular Quark, however, is the on-die 6-axis accelerometer/gyro and the Bluetooth communication hardware.

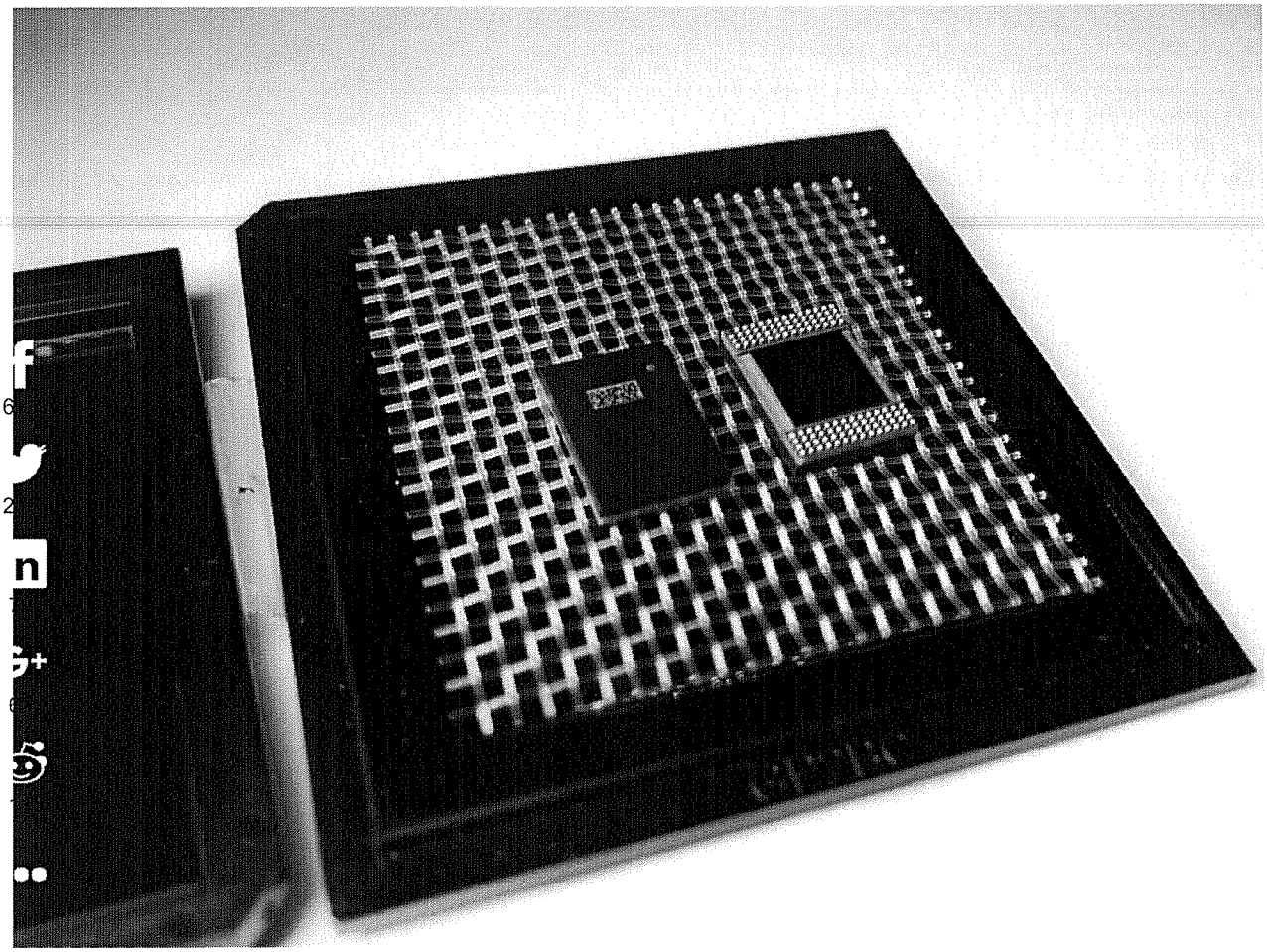
External I/O Interfaces	
Bluetooth	Bluetooth® Smart
Arduino Headers	14 digital (4 w/ HW PWM) 6 analog input for ADC 3.3V I/O, with 5V tolerance
USB	1x USB 1.1 device, 3 end points
LEDs	1 green LED on D13 per Arduino 1 red LED for fault 1 green for activity 1 green for power
Debug	JTAG + Soft debug

Power	
USB	5VDC, Current limited to 500mA Max
DC in Jack	7VDC-18VDC (20VDC max) (1.0A maximum system current)

Programming the Arduino 101 is exactly the same process as programming an Arduino UNO. Using the Arduino IDE, you write your code, compile it, and upload it to your board. Intel is also providing special libraries to let programmers utilize the Curie module's unique features, such as the

accelerometer with gyroscope and Bluetooth. It is unclear the level of software support for these features at product launch, but expect Intel to continually improve the software experience.

INTEL CURIE MODULE



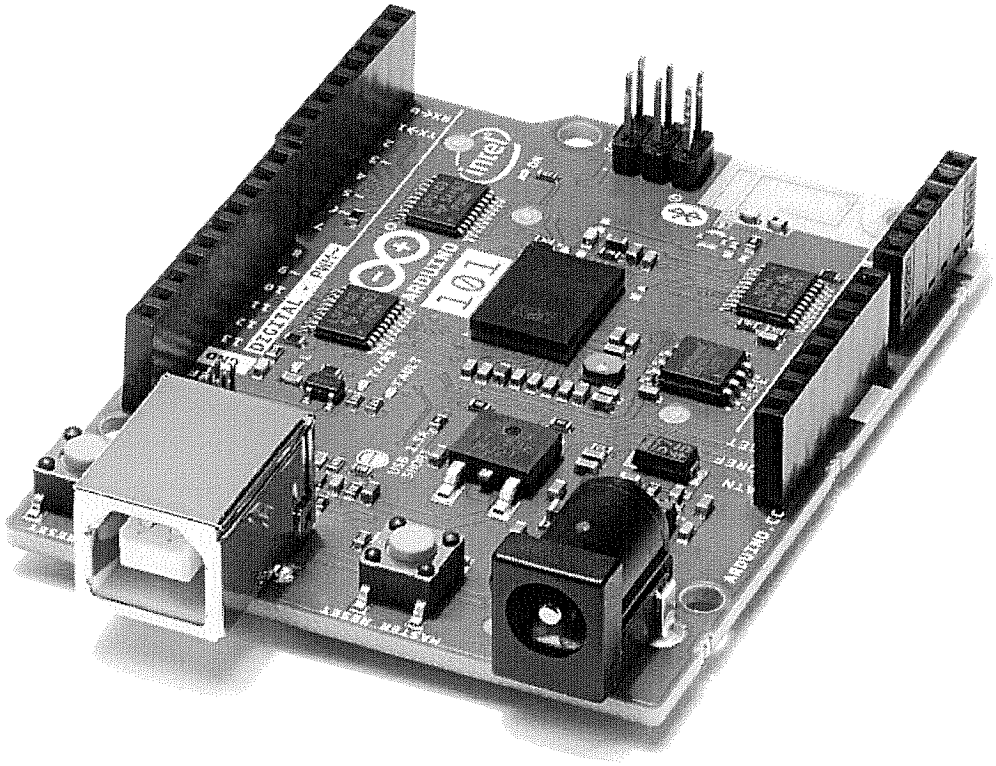
Two Intel Curie modules, the clear tape on the left is standard width Scotch tape

When we first saw the Curie at CES this year, Intel had packaged it on tiny, button-sized module that we assumed would be marketed as a board for wearable projects. As far as we know now, that module is not scheduled for release. The Curie-powered Arduino is a new direction for this technology.

It's a new go-to-market strategy for Intel; a previous system-on-chip, the Edison, was packaged by Intel itself, and Intel also made accessory boards for it (Sparkfun made accessory boards for the Edison as well).

Intel Curie System-on-Module	
Quark SE	32MHz 32-bit IA and a 32-bit DSP
	32MHz 32-bit DSP Sensor Hub
	128-node Neural Network
Bluetooth	Nordic nRF51822
Memory	RAM: 80kB (internal to SoM) FLASH: 384kB (internal to SoM),
Sensors	6-axis accelerometer/gyro (Bosch BMI160)

Other Key Features
USB mass storage mode – On-board 2MByte FLASH
Certification in over 100 countries
Standard Arduino IDE
HW reusable for Curie Prototyping Kit with new SW & FW
JTAG debug port



INTEL AND ARDUINO

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How to Build a Self-Balancing Autonomous Arduino Bot

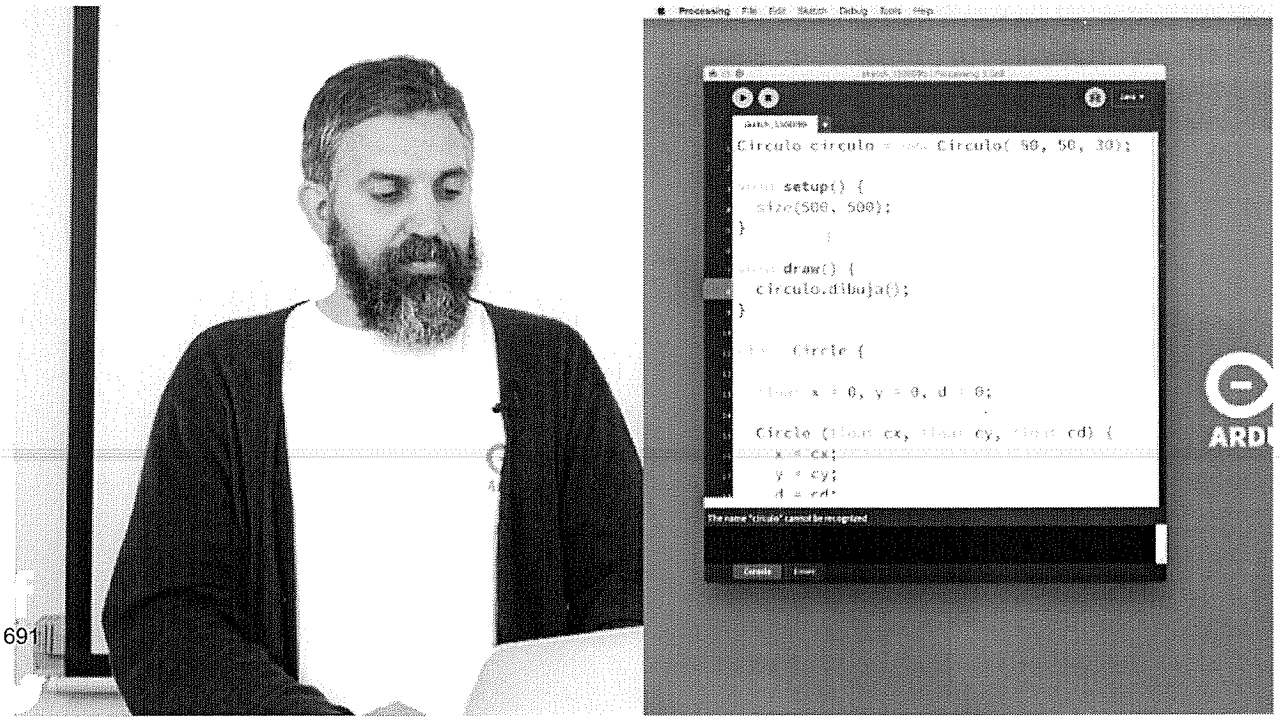
This is not the first collaboration between Intel and Arduino. Nearly two years ago, also during Maker Faire Rome, Intel and Arduino announced the Intel Galileo, a microcontroller board with Arduino-compatible headers. Like the Edison, the Galileo was Arduino-*certified*. The Curie-powered Arduino 101, though, is a co-branded venture with Arduino. It doesn't need certification. It *is* an Arduino, and could be more attractive to the Arduino community because of that.

ARDUINO GETS ITS WAY

Prior to the release of the Arduino 101, the specifications for the Curie indicated its power requirements were only 1.8V, a common voltage for a coin cell battery. Technically, the power requirements remain the same for the Curie module. However, the power requirements dictated by the Arduino ecosystem require at least 3.3V to properly power the I/O. Dictated by the collaborative nature of the project, the Arduino 101 design does not allow the Curie to be powered by a coin cell battery.

Another change: The Curie module is known to have a 128-node neural network, which can be used for machine-learning applications. But software support for that technology is not shipping at this time. Intel says it will be supported later.

Beyond these two differences, the Curie module has nearly identical specs to the product announced at CES.



David Cuartielles presenting Episode 1: Processing (Part III) screengrab via ***CTC***

ARDUINO 101 IN THE CLASSROOM

The final aspect of the partnership is Intel's marketing of Arduino co-founder David Cuartielles' **Creative Technologies in the Classroom (CTC)**. The courseware will be updated to reflect the new capabilities of the Arduino 101, like Bluetooth. Previously, the **curriculum** used the Arduino UNO to playfully teach students age 11–14 (though it's really appropriate for anyone) basic skills in programming, electronics, and mechanical design. While little-known in the United States, CTC is used in 125 schools worldwide, reaching approximately 3,500 students. Intel's push could help this curriculum land in thousands of schools world-wide.

Related Topics **#ARDUINO** **#EDUCATION** **#INTEL** **#ARDUINO GENUINO** **#ARDUINO 101** **#INTEL CURIE**

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