Why I love Arduino

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Arduino microcontroller is an excellent way to learn about controlling electronic and electrical gadgets. Arduino is a freeware and even their IDE (Integrated Development Environment) is a freeware. Their hardware is also free - meaning that you can download their PCB designs and just build them yourself - no royalties need to be paid. Developing small projects with big impact are possible with Arduino, e.g., Talking Microwave oven, Coffee-pot, Bike Turn Signals, Medical devices, Singing shoes, Mood Light, Swimming snake, RFID cat door, RFID enabled clothes washing, Gas detector, Own Your Robot, Weather station, Agricultural sensor network and many other useful projects. Check the following sites: www.instructables.com, www.adafruit.com and www.arduino.cc

You can teach students a lot of input devices (e.g., sensors, stepper Motor, Blue tooth and Internet connectivity, etc) and output devices (e.g., LED, robotic motors, etc). The hardware systems are "stackable" – i.e., you can stack the LED PCB on top of the Robotic motor or vice versa - they all have simple common interoperable interfaces.

Everyone can learn this - the programming language is extremely simple. Your grandfather can learn the basic techniques within 15 minutes -;) I am sure he will then start programming this himself - I am very serious about this. Yes, yes, even computer scientists can learn this in a matter of 1-2 minutes. I think all School kids must be introduced to this. They are bright and willing to learn and they are fast learners too (hum, unlike yours truly -;)

There is an equivalent one - probably cheaper and with better functionalities - I have not yet checked out, called MicroBit from the UK http://microbit.org/ which is really sexy. Yes, I was going thru' their website and it is really truly appealing.

I plead and appeal to all of you that this technology must be introduced to School children and then to all our engineering students and also to our medical and nursing students. This will also lead to a number of projects that could be applied for funding to many organizations.

Several projects are available at: http://www.instructables.com/id/Arduino-Projects/

- Tweet-a-Pot
- 3-Dimensional LED cube
- World Clock
- Bike Turn Signal
- Get your own EEG and ECG machines
- Singing shoes
- Mood Light
- Swimming snake
- RFID cat door
- Gas detector
- Your Own Robot
- Weather station

MicroBit (http://microbit.org/) is another popular microcontroller available along with a fancy set of paraphernalia using which one can create several interesting applications.
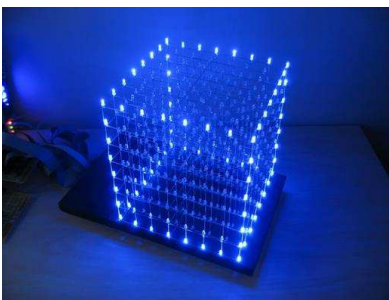
The Arduino platform is useful to teach and experiment with IoT (Internet of Things). Many projects are possible, including the following:

- Precision Agriculture
- Precision instrumentation
- Chicken incubator design (also baby incubator - well, Humidicrib design - including for prenatal baby monitoring)
- robotics and micro-robotics
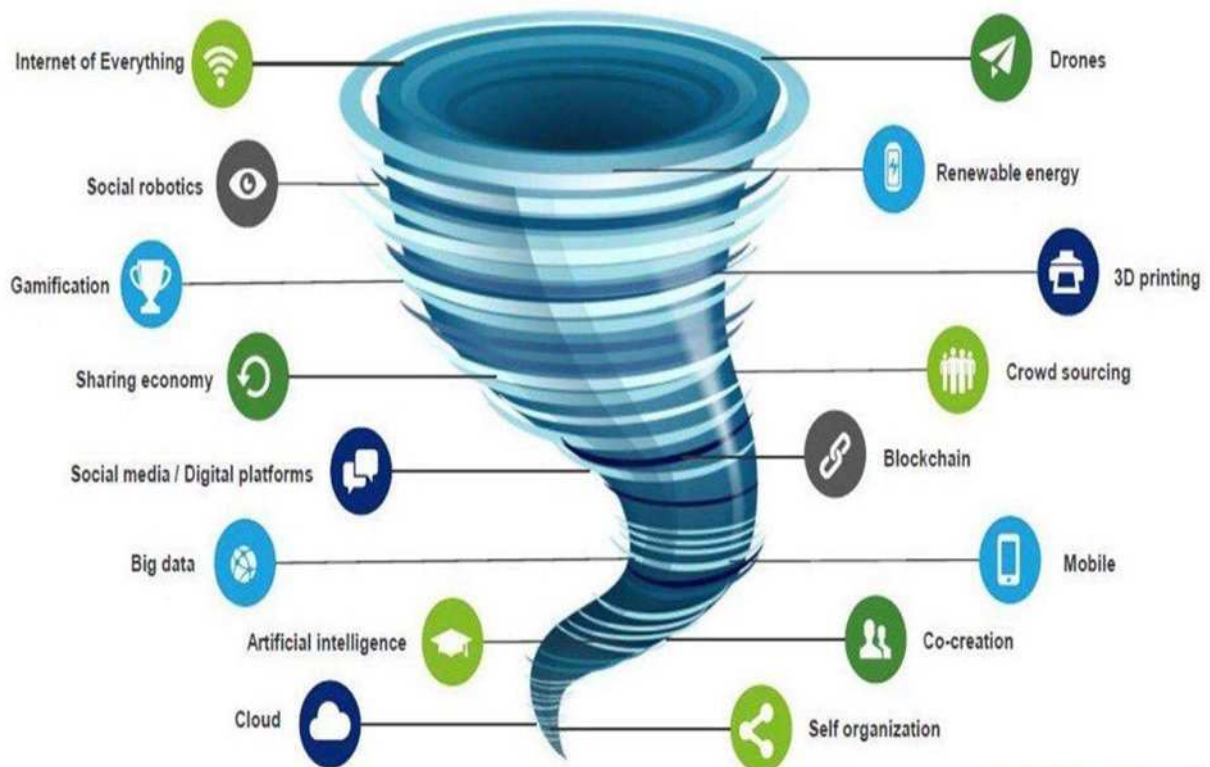- embedded systems
- in-body sensors
- and many many more...........

For bigger project: e.g., Precision Agriculture, you can deploy an array of DHT22 sensor (which measures both temperature and relative humidity - in soil, air and in-plants as well) and create a sensor networks - then you can try other such sensors for monitoring pH values, Phosphate, etc, etc. Bingo, your local agri-based village would become the centre for Precision Agriculture.

eHealth project could potentially develop Lab-In-A-Briefcase to perform more than 1000 clinical tests in rural settings and send the results via the Internet or cell phone.

Some pretty pictures using Arduino:

16 Emerging Technologies Exponentially Impacting Our Lives

Internet of Everything — Drones — Social robotics — Renewable energy — Gamification — 3D printing — Sharing economy — Crowd sourcing — Social media / Digital platforms — Blockchain — Big data — Mobile — Artificial intelligence — Co-creation — Cloud — Self organization

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