

DEMOCRATIZING HARDWARE

CHRIS WILLIAMS :: @VOODOOTIKIGOD



WHO IS THIS GUY?

- Chris Williams AKA Voodoo Tiki God
- JSConf, RobotsConf, CapitolJS, and others
- Creator of Beer.js
- JS Logo
- node-serialport
- Instigator of Node(Copter|Bots|Rockets|Boats)
- Founder/CTO of Emerging Technology Advisors



MY QUEST

A cardboard robot, resembling a Tamagotchi, stands on a map of Europe. The robot is made of cardboard with a simple face and is positioned over the map. The map shows various countries like Italy, Greece, and Bulgaria. The background is dark, and there is a red vertical bar on the right side.

- ☐ Take the “hard” out of hardware, make the complex simple.
- ☐ Make hardware available and accessible to everyone.
- ☐ ...
- ☐ Await the coming of our Robot Overlords



ROBOTICS

As Simple as a Web Page

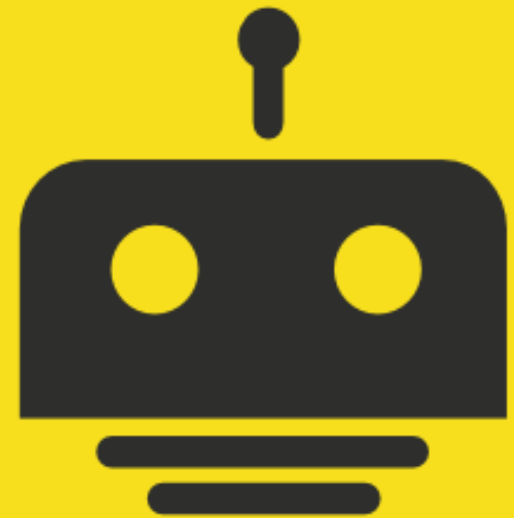


NODE.JS

The world's most _____ library on the world's most _____ language.

NATURAL OVERLAPS

- **Evented model ~= hardware interrupts**
- **Objects in OOP (and the DOM) are meant to model objects in real life**
- **Hardware is, historically, single threaded, hey so is JS**
 - Blocking is bad in both worlds
- **JavaScript allows almost anyone to write “code” almost anywhere.**



NODEBOTS

The Rise of JS Robotics



NODECOPTER

Controlling Drones with JS





JOHNNY-FIVE

Is Alive... Thanks to Rick Waldron (@rwaldron)

```
1 var five, temporal, Nodebot;
2
3 five = require("../lib/johnny-five.js");
4 temporal = require("temporal");
5
6 five.Board().on("ready", function() {
7
8     Nodebot = new five.Nodebot({
9         right: 10,
10        left: 11
11    });
12
13    this.repl.inject({
14        n: Nodebot
15    });
16
17    n.fwd(5);
18 });
```

REPL'ED ROBOTICS

Behold The Real Power of JavaScript

**FROM THE
OTHER SIDE**



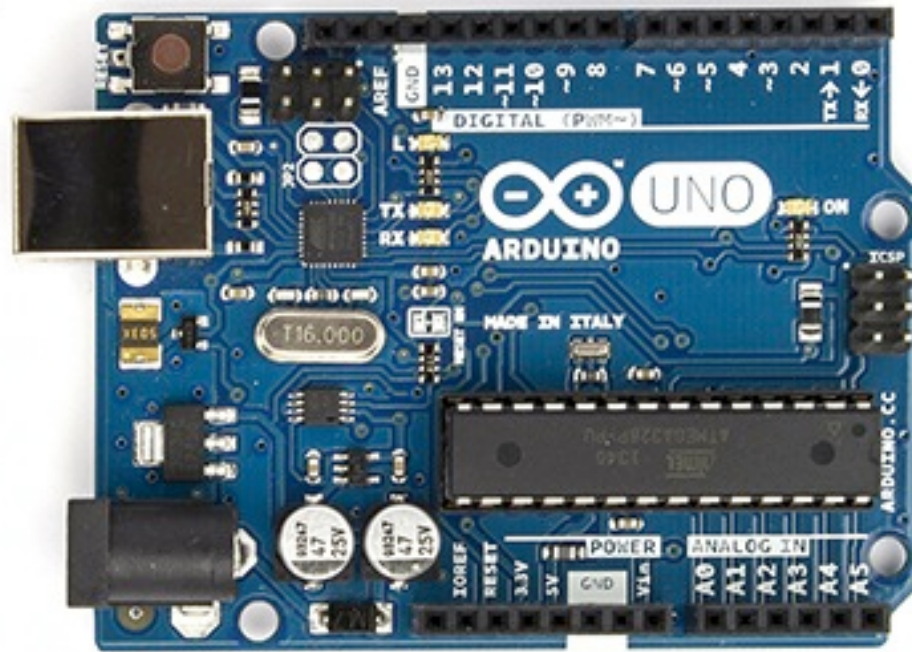


open source
hardware

MAKER MOVEMENT

Tech-influenced DIY Community.





ARDUINO

The Original Heart of NodeBots

Transplanted out of Arduino Processing...

INNOVATION BEGETS INNOVATION

**THE FUTURE IS
BIGGER AND
BRIGHTER**





INTERNET OF AMAZING THINGS

Wireless All The Things



3D PRINTERS + CNC + LASERS

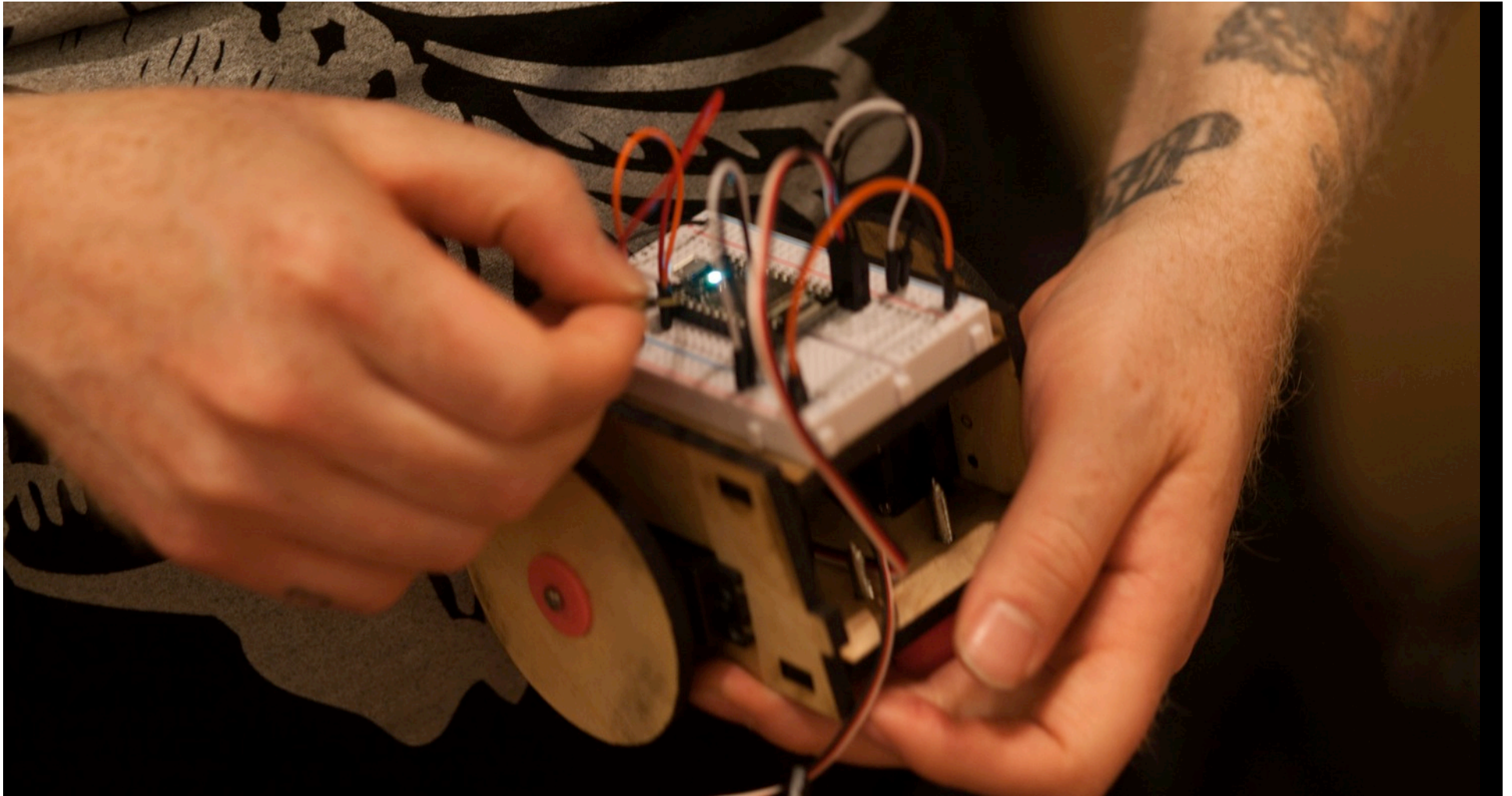
Digital Design, Physical Manifestation, Total Awesomeness



DEMOCRATIZATION OF HARDWARE

ACCESSIBLE ROBOTS FOR ALL





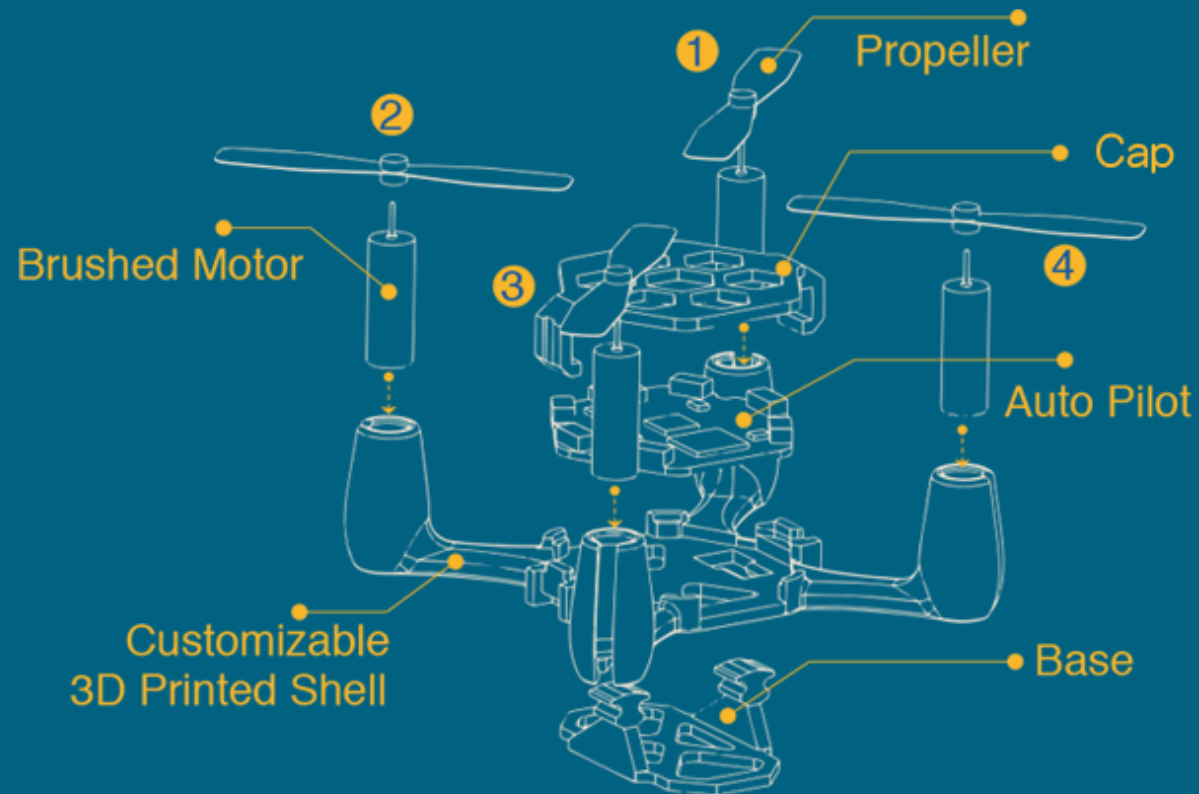
PAWELBOT

Made by Developers, \$35 total cost, Available to All

Photo: Ian Cole, RobotsConf 2013

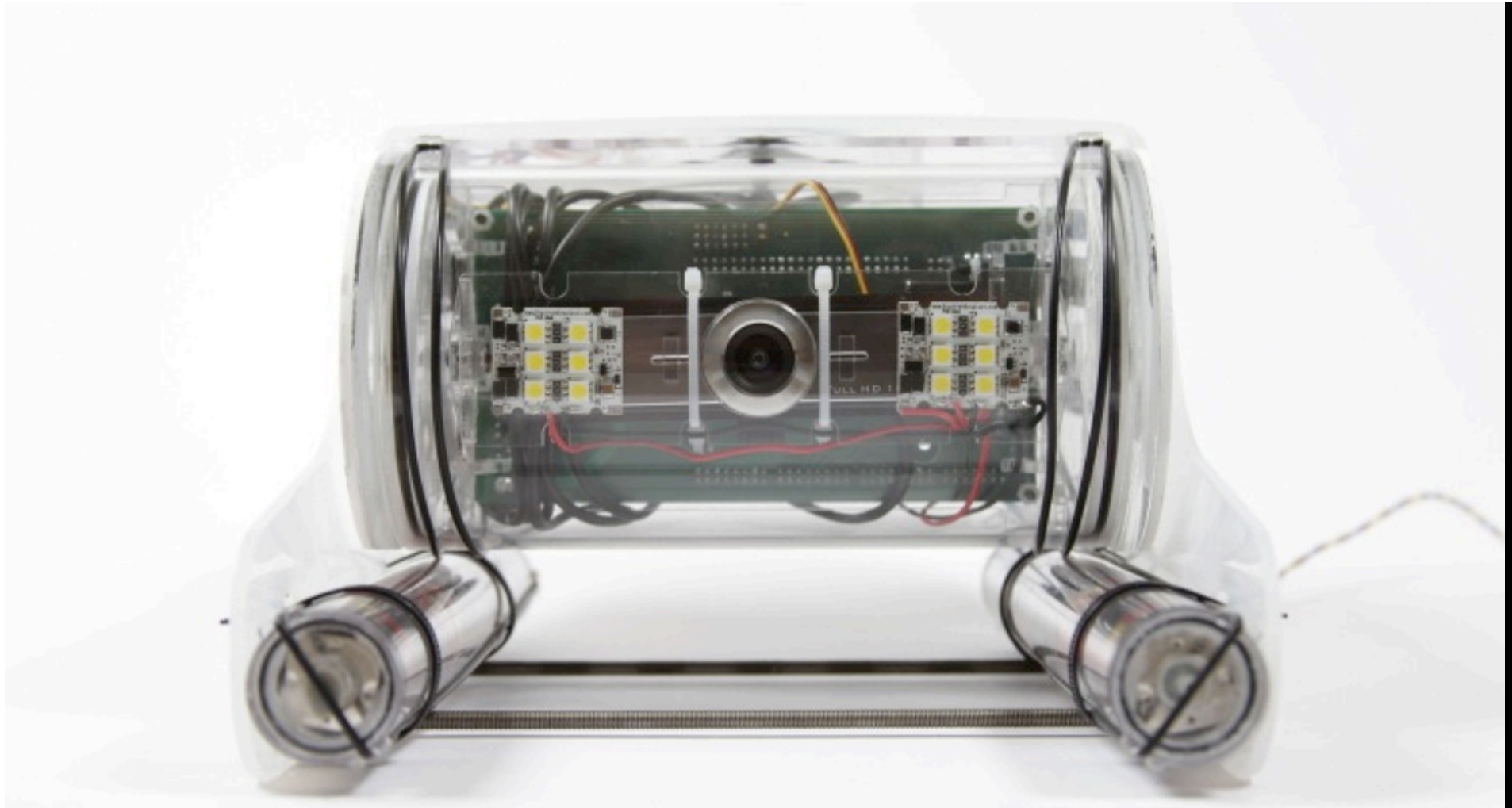


SEE THE WORLD
FROM A DIFFERENT PERSPECTIVE!



FLEXBOT

<http://flexbot.cc> 3D printed, customizable, quadcopter ~\$50.



OPENROV

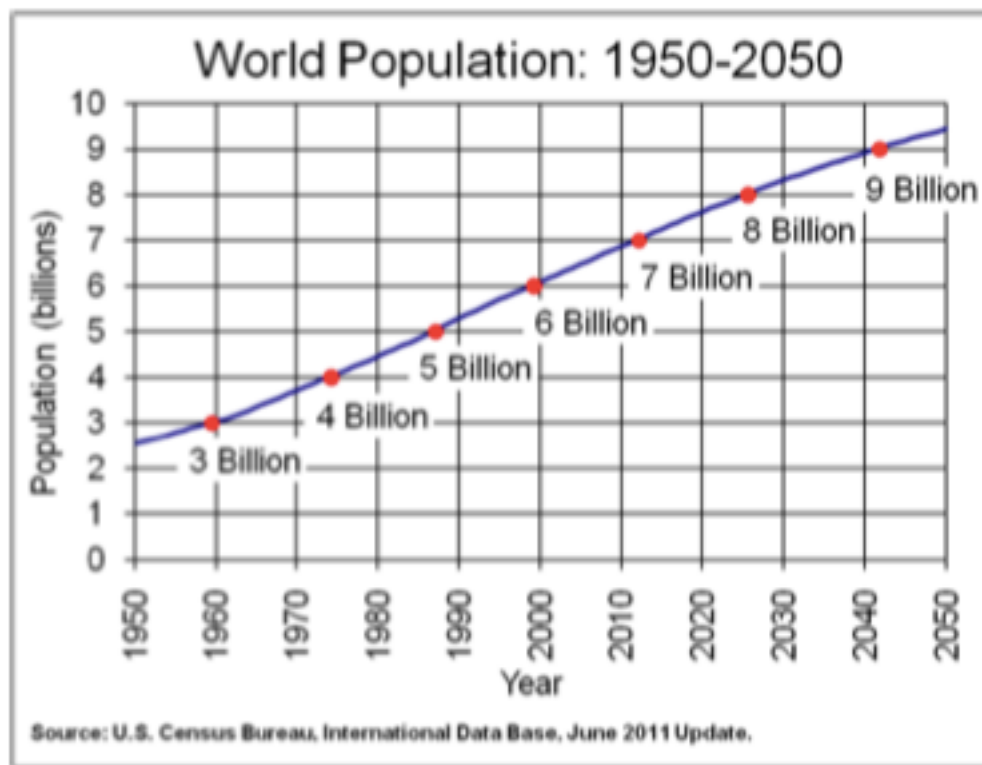
Node.js Powered Underwater Exploration Device

BUT WHY?

**PEER INTO THE FUTURE WITH ME
SCARY, RIGHT?**

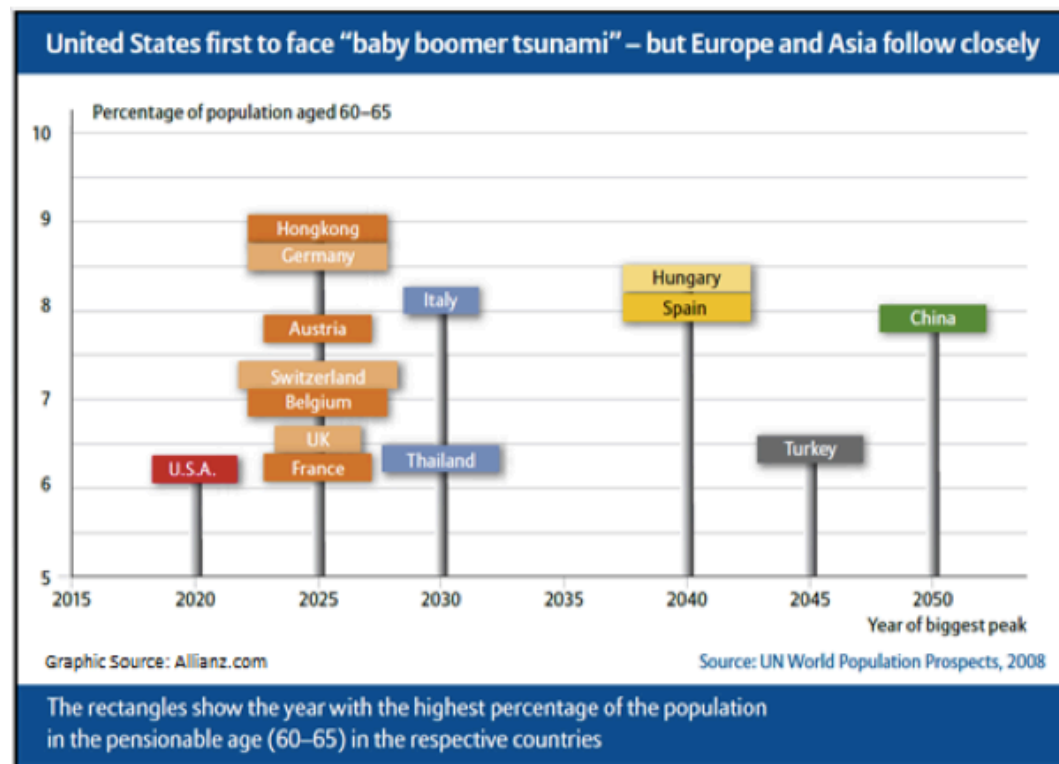


POPULATION GROWTH



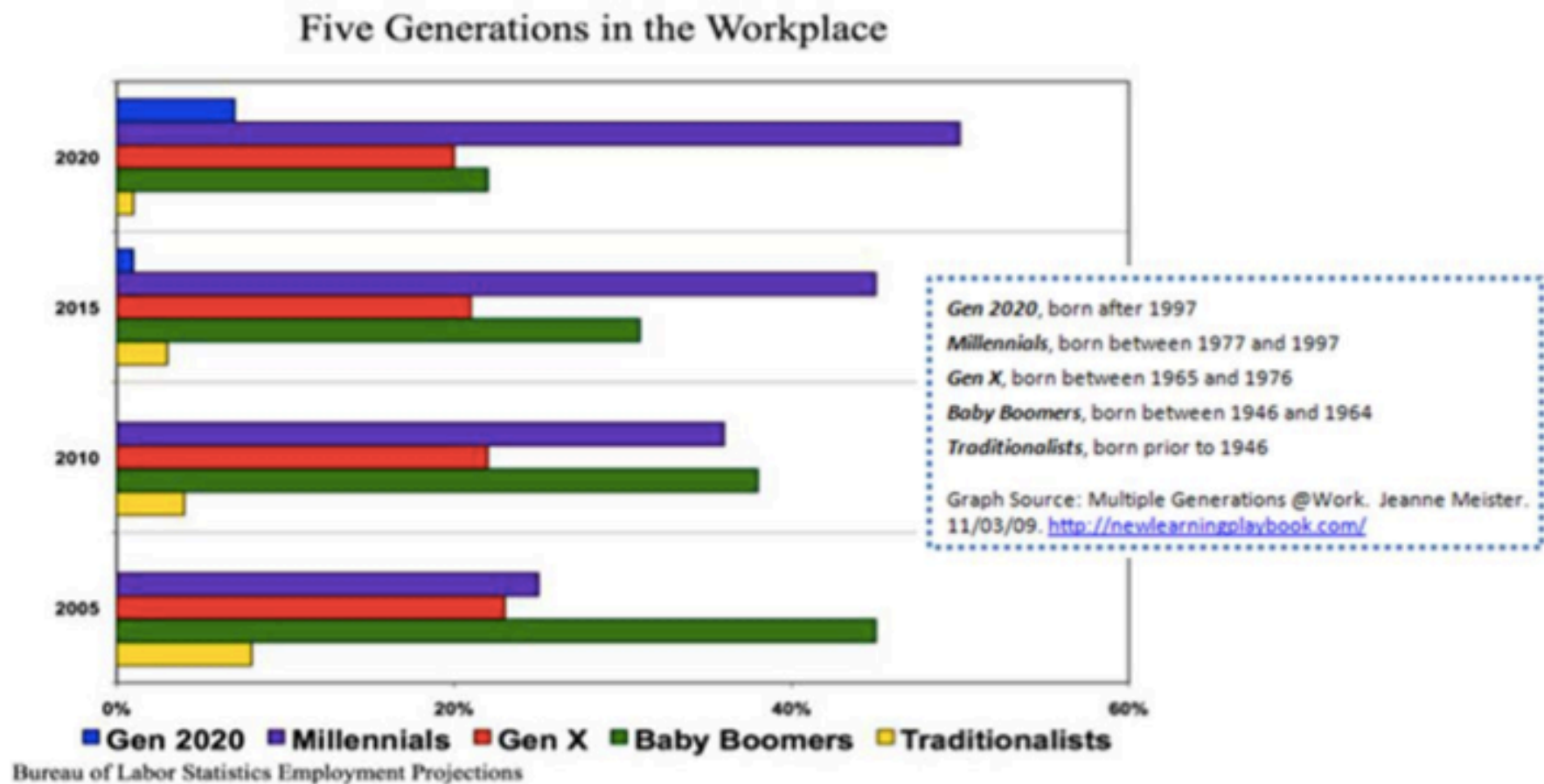
Source: [US Census Bureau, International Data Base, June 2011 Update](#)

AGING POPULATION BASE



Graphic from Allianz.com; Data source: UN World Population Prospects, 2008

GENERATIONAL SHIFT



Multiple Generations @Work Jeanne Meister; 11/03/09 <http://newlearningplaybook.com>

INTEL LABS

“Trends are already indicating that a growing number of jobs will require a significantly more complex set of interdisciplinary skills such as problem solving, judgment, listening, data analysis, relationship building, collaborating and communicating with multinational co-workers.”

**DEMOCRATIZED
ACCESS**

**DEMOCRATIZED
KNOWLEDGE**

SOCIETAL CHANGE



MODERN EDUCATION

**PHYSICS, MATH, SCIENCES, LITERATURE,
AND ART BLENDED TOGETHER THROUGH
DRONES AND FABRICATION.**



LOGIC + CREATIVITY

A MORE PERFECT HUMAN



ART + SCIENCE

A MORE PERFECT HUMAN





PROGRAMMABLE MATTER

The coming technical revolution

Source: http://en.wikipedia.org/wiki/Programmable_matter Adaptnetic Structures

THE FUTURE IS NOW

IT IS TIME TO START TOMORROW, TODAY.

