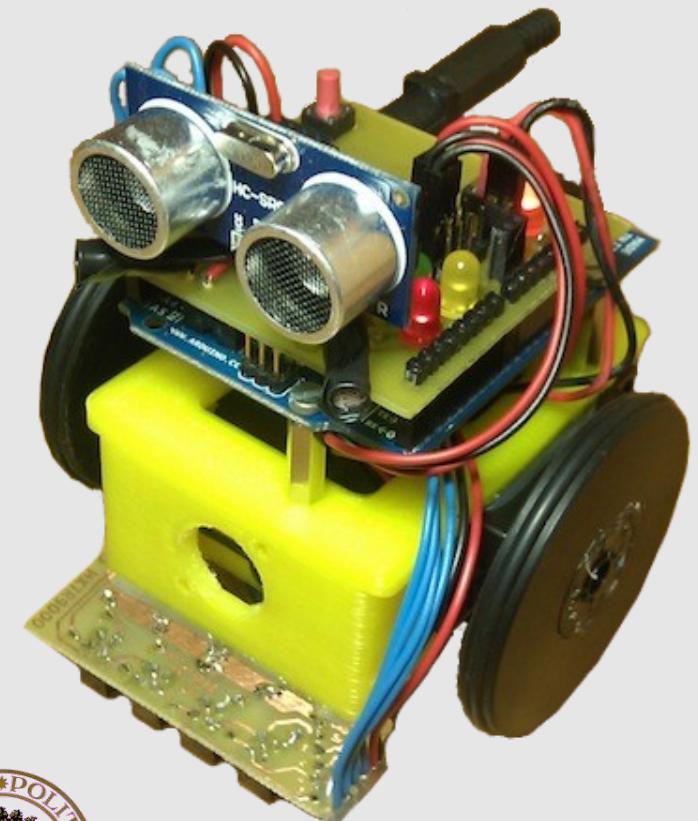


LOW COST EDUCATIONAL PLATFORM FOR ROBOTICS, USING OPEN-SOURCE 3D PRINTERS AND OPEN-SOURCE HARDWARE

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5th International Conference of
Education, Research and Innovation

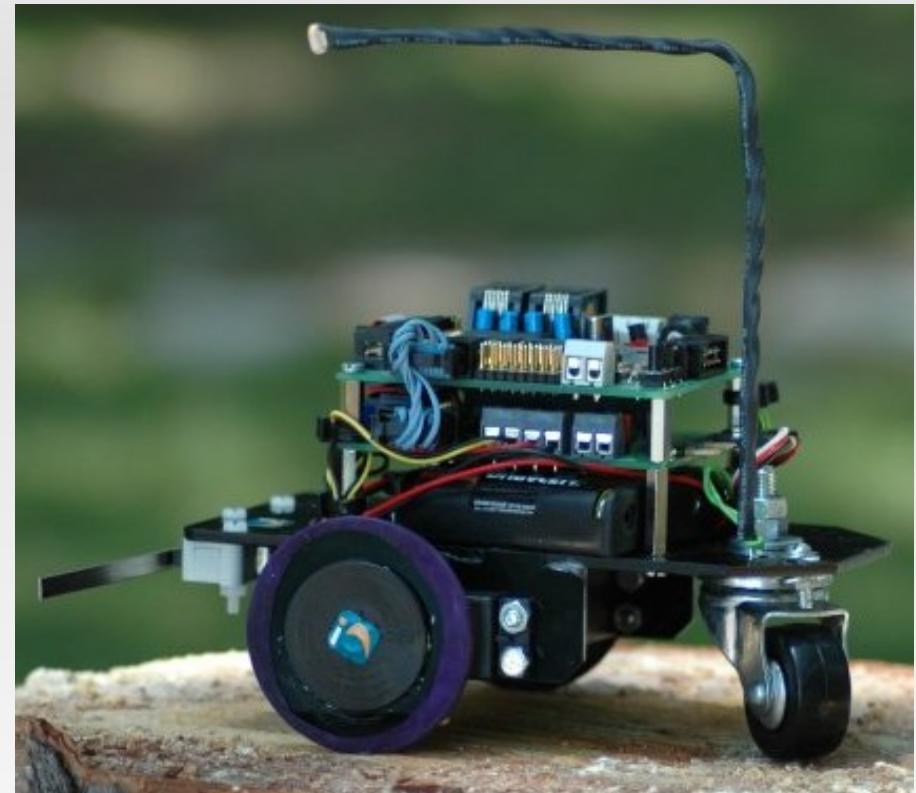
Robots in education

Interdisciplinary field:

- **Mechanics**
- **Electronics**
- **Programming**

Platform requirements:

- **Low cost**
- **Easy to repair**
- **Flexible and expandable**

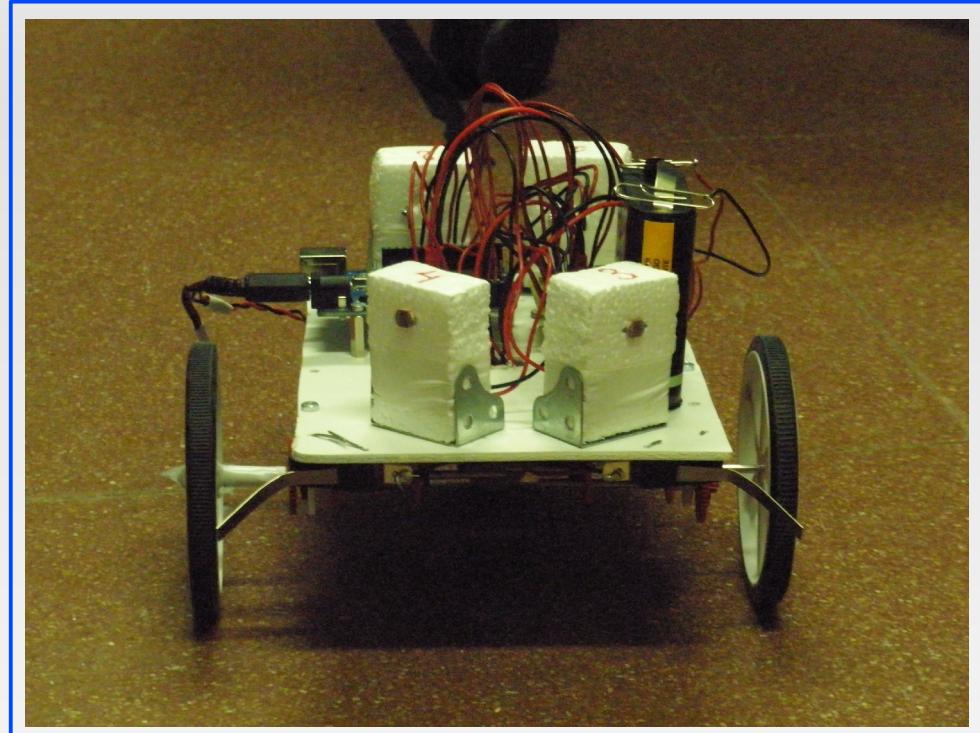


Type of platform

Commercial

vs

Custom

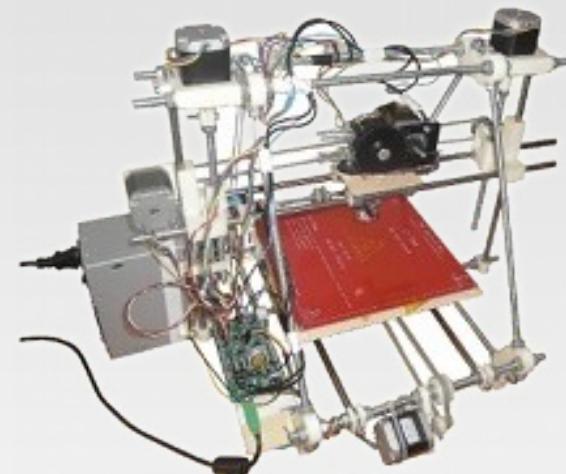


**Low cost? Easy to repair? Flexible and expandable?
Industrial?** **Home-made?**

Printbots

Build process:

Open-source 3D printer



Plastic parts



Electronics,
motors, sensors

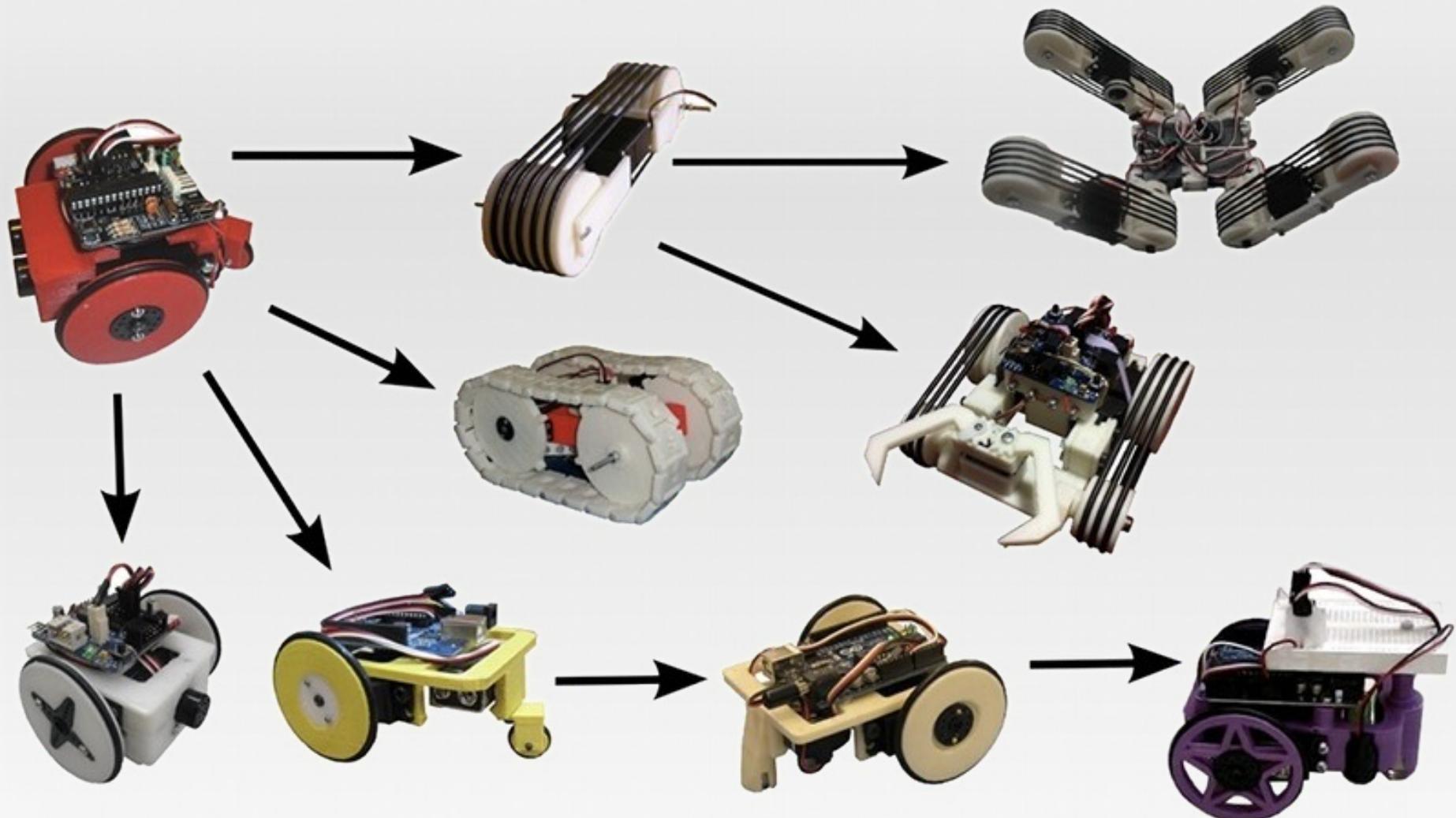
Printbot



- Custom
- As simple as required
- Mass producible

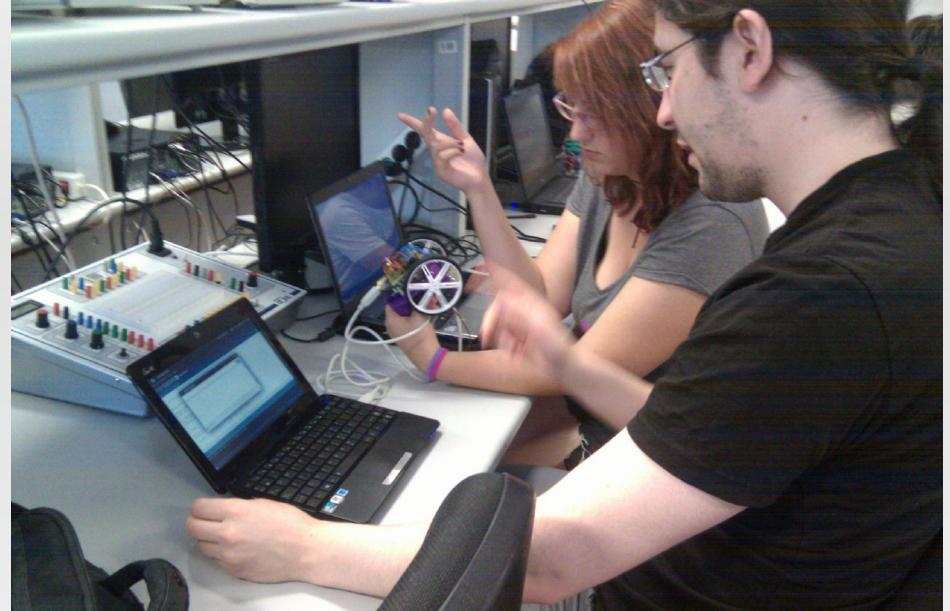
- Open-Source design
 - Shared by the community
- www.thingiverse.com... etc

Evolution and diversification

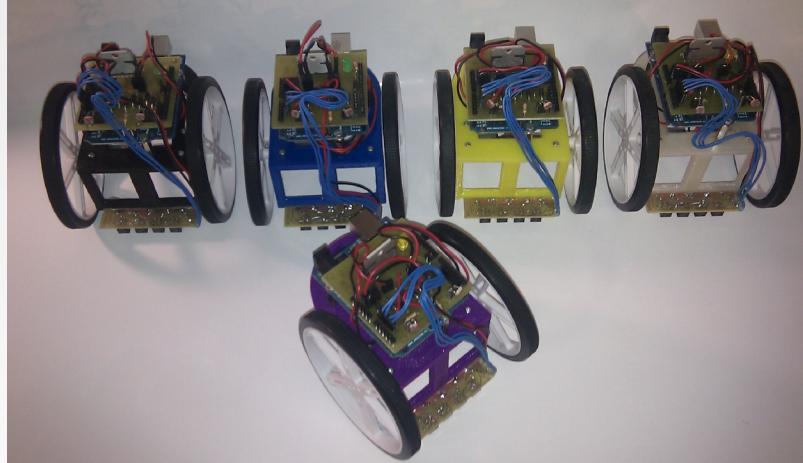


Fast growing open-hardware ecosystem!

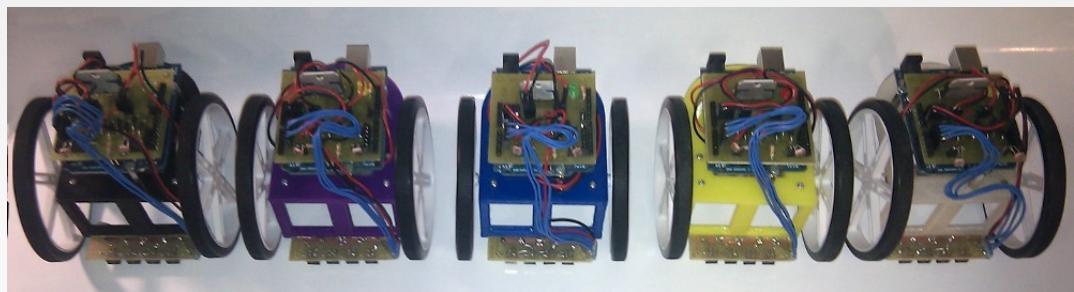
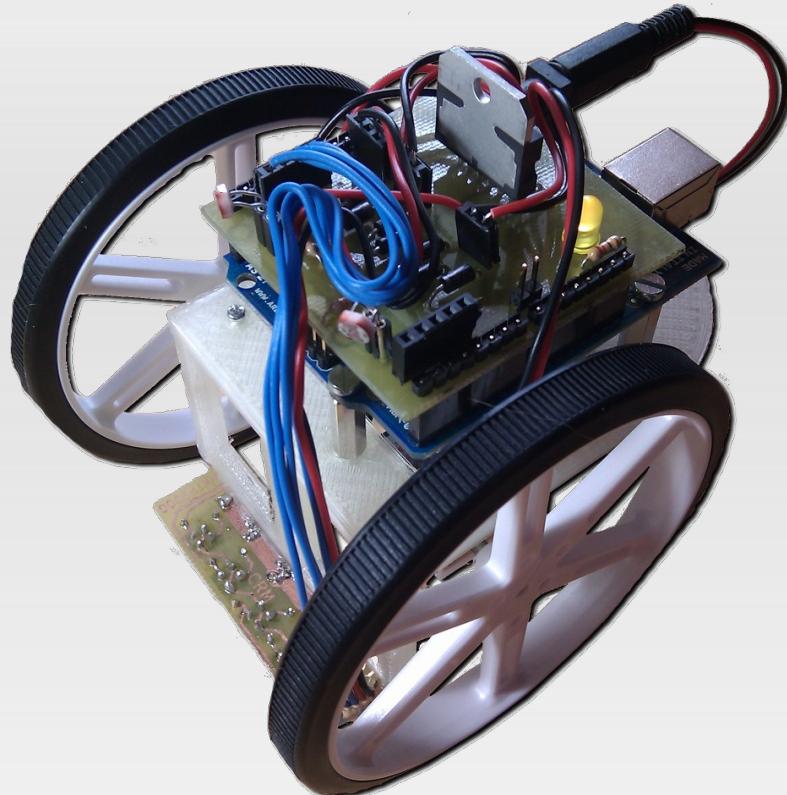
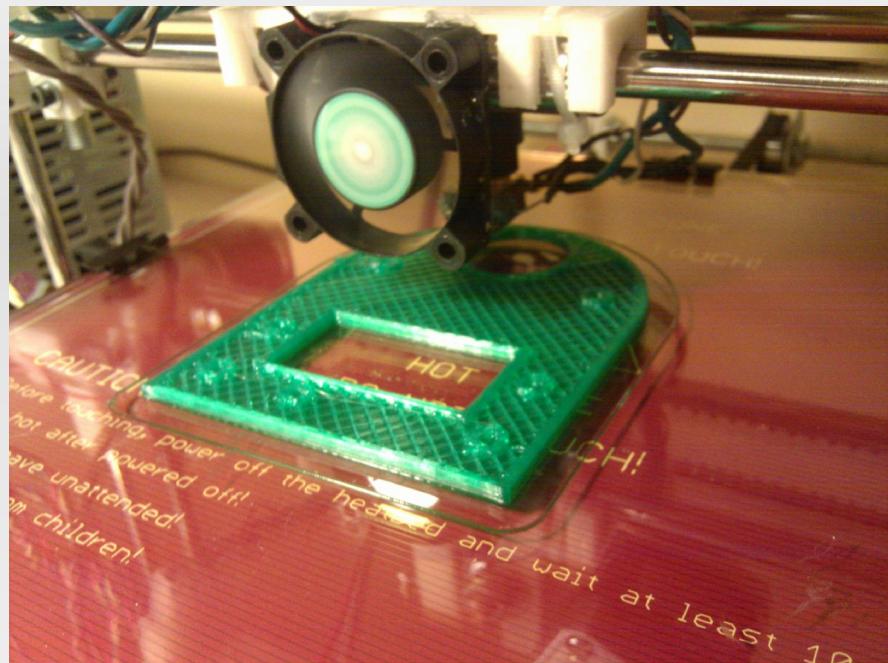
Robotics introductory course



- **20 engineering students**
- **15 hours (5 days)**
- **Robotics and Mechatronics group (UAM Madrid)**



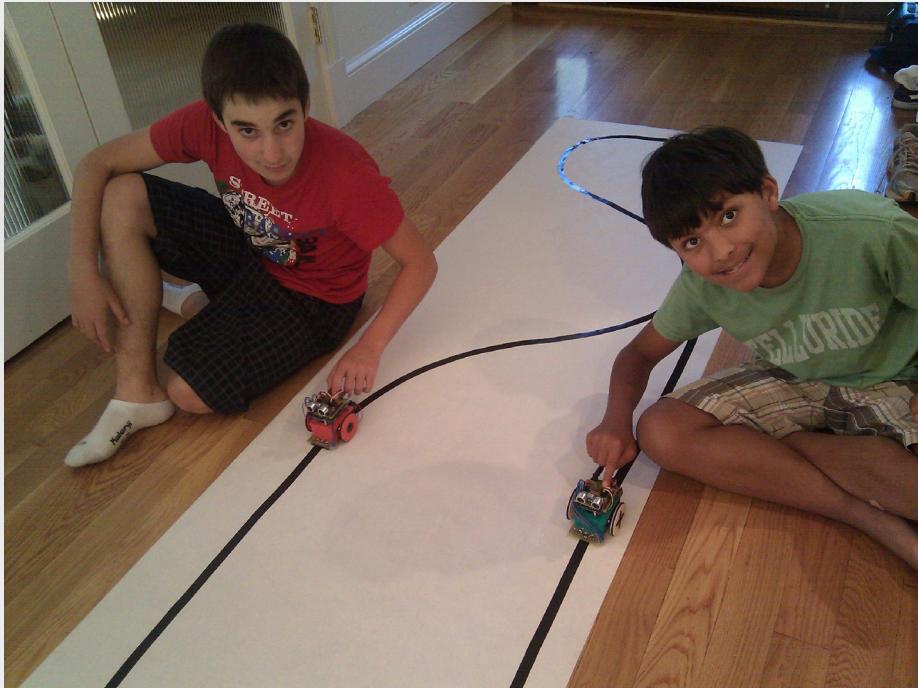
Our first design



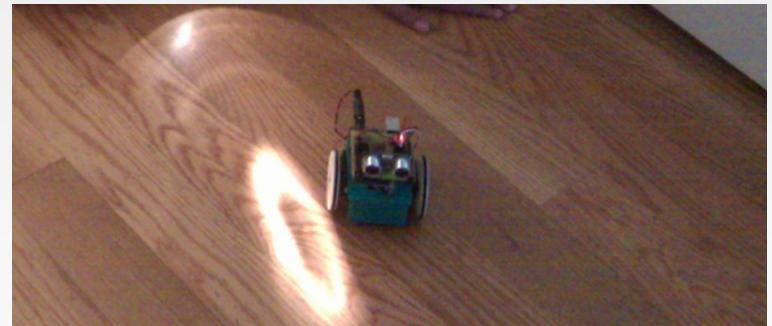
Available resources:

- **Arduino boards**
- **Motors and wheels**
- **Simple PCB etching**

ArduSkybot Summer Workshop

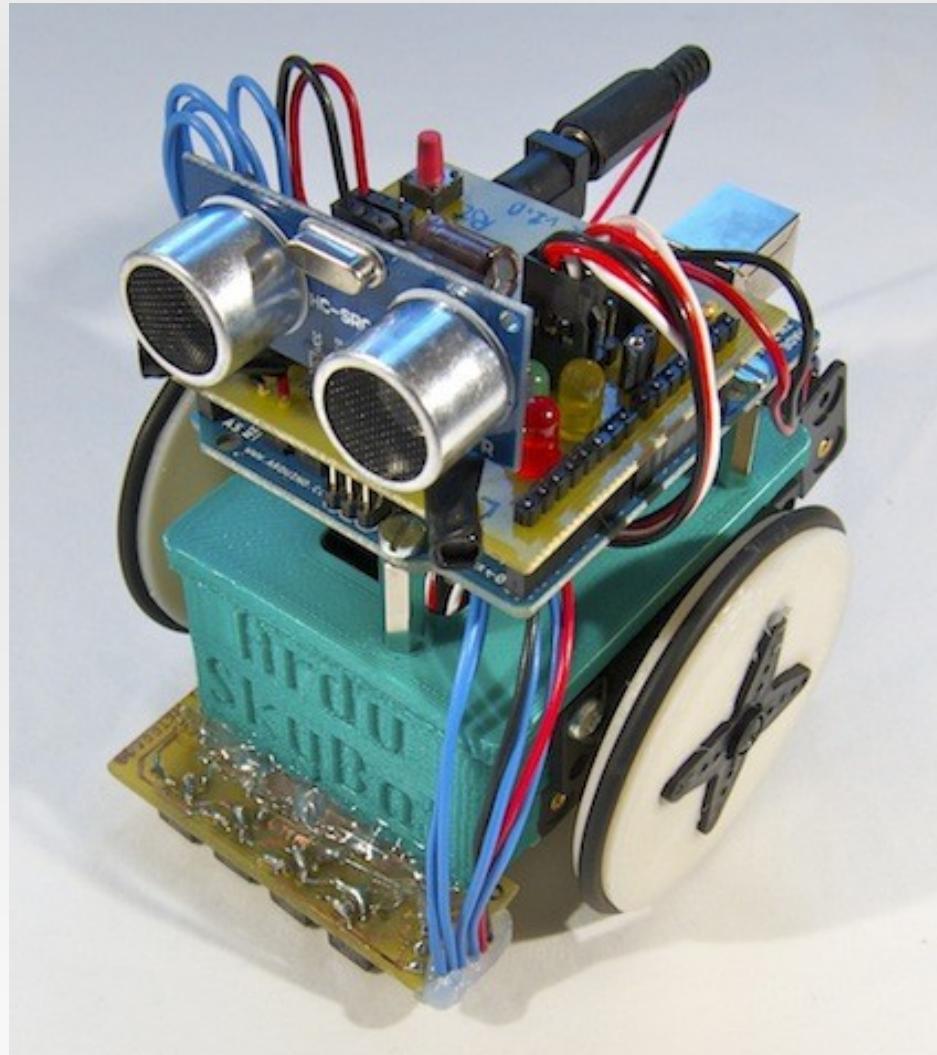


- **4 primary students**
- **10 hours (4 days)**
- **Palo Alto, California (USA)**

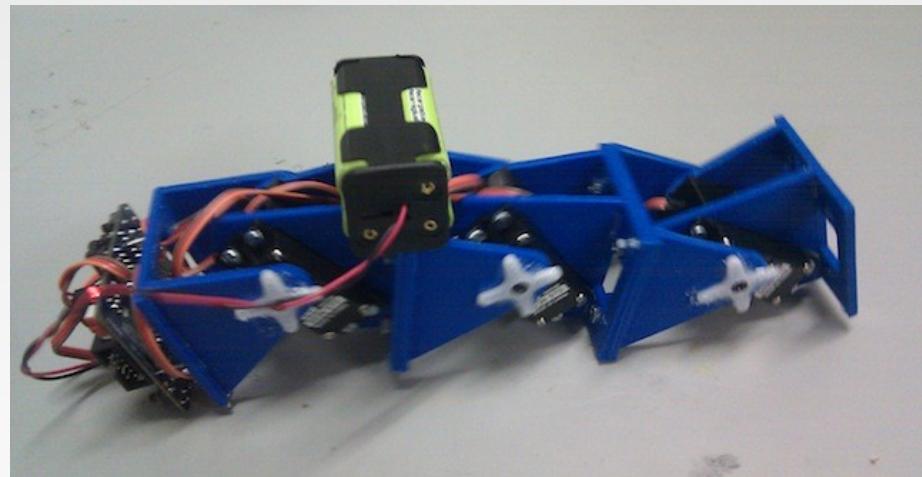
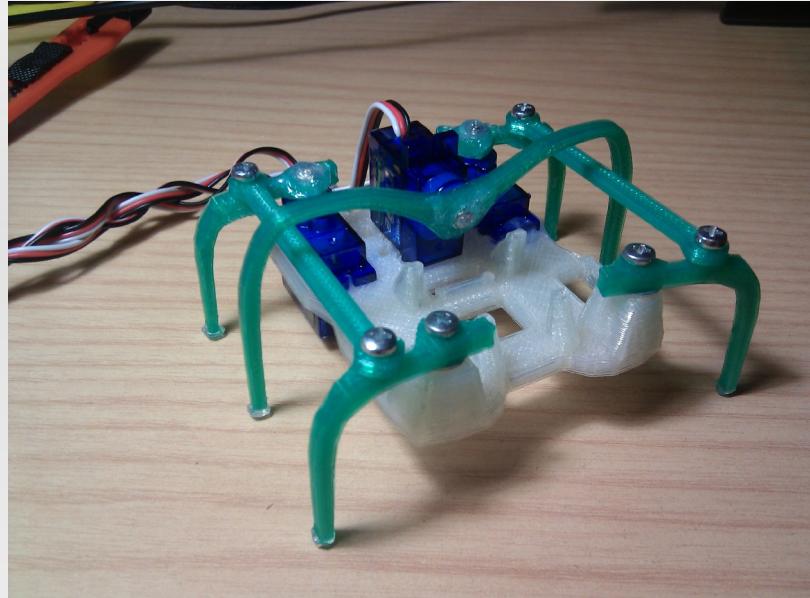
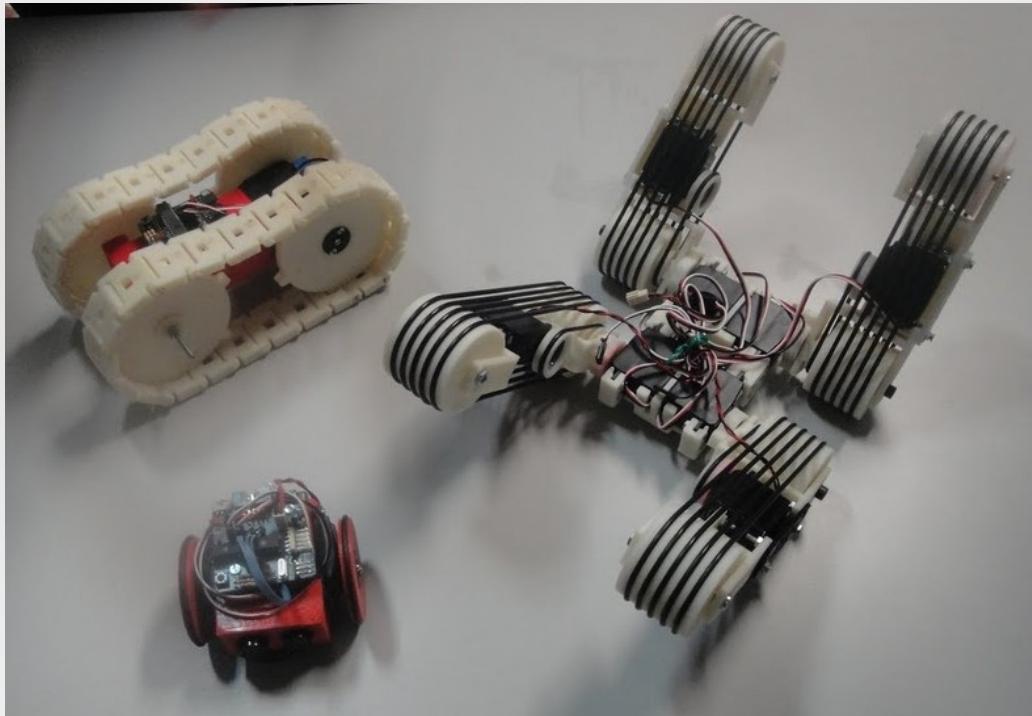


The ArduSkyBot

- Various sensors/actuators
- Simple assembly
- Based on the MiniSkybot and the HKTR-9000
- Designed in one week
- Four robots ready in record time!



Printbots are great!

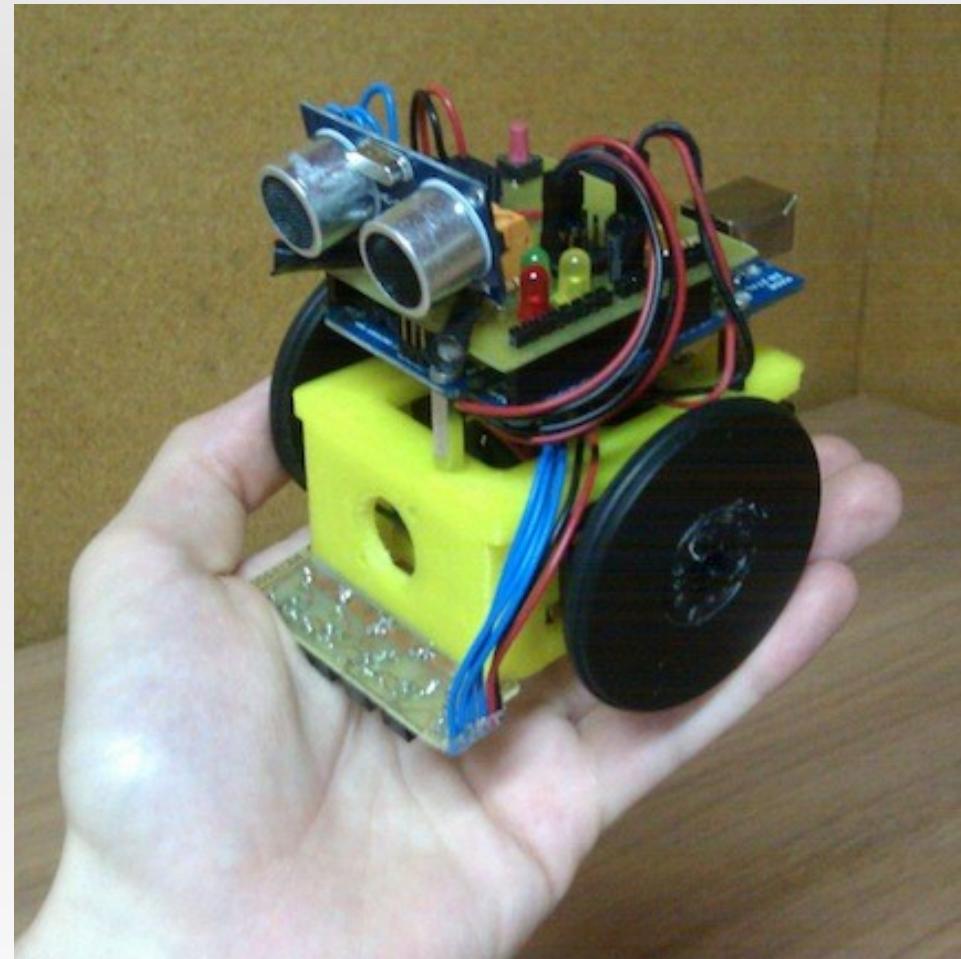


**This design approach
will work with any kind of
robotics course**

Conclusions/Discussion

Using printbots simplifies setting up robotic courses:

- **Small setup effort**
- **Custom platform**
- **Fast robot replication**
- **Low cost**
- **Use of available resources**
- **New way of technological education**



Questions are welcome

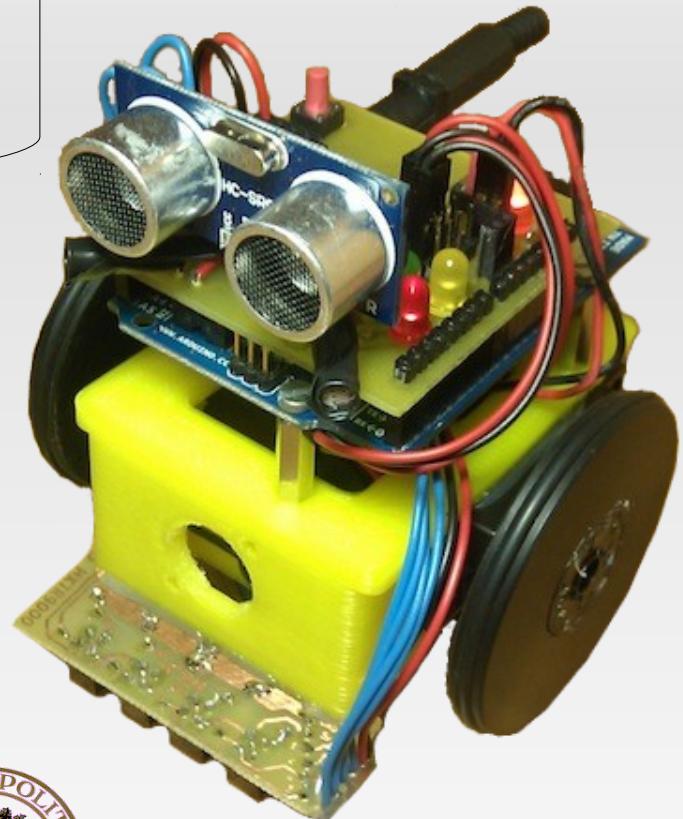
Thanks for your attention!

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More information:

¹ <http://www.carlosgs.es>

² <http://www.iearobotics.com>



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