

Hobbyist club turns ideas into robots



Photos by Derrick Sobodash

OpenDrone's members meet every week to build simple machines and robots. Jose Galvez (above) shows a Wi-Fi car based on DFRobot's Turtle kit.

By Derrick Sobodash

Most Beijingers hire an *ayi* to take care of their plants when they leave town. OpenDrone members build robots.

Jose Galvez, a 27-year-old Spaniard, might be the first Beijinger with a robotic garden in his bathroom. The maze of hoses and moisture sensors is connected to a hacked-up wireless router that lets Galvez adjust the lighting and watering of his plants from any Internet-enabled device.

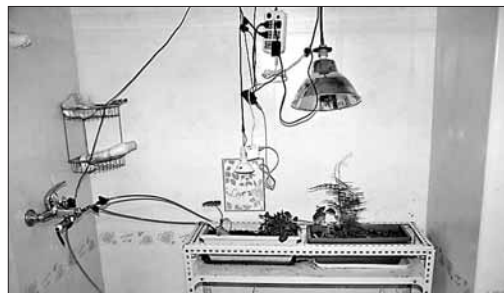
He calls it the "Garduino" – a nod to the open source technology at its core: an Arduino open source single-board microcontroller.

Galvez moved from Madrid to the Huilongguan community of Changping District three years ago to "live in China and play with robots." Today, he does this every week with his friends at OpenDrone, a new open source hardware and robotics group he helped found.

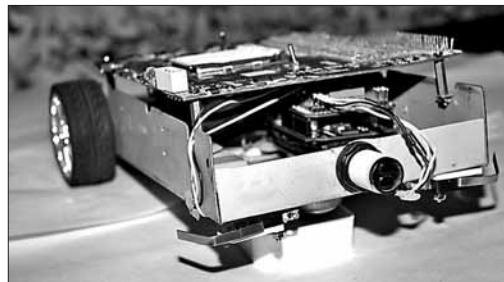
OpenDrone has been meeting on Thursdays in Haidian since November. Its core projects are a flying quadcopter, a four-propeller flying device, and a robotic car controlled over Wi-Fi.

But the group has a greater purpose of helping members learn the basics of electrical and digital design and encouraging them to share their experience and ideas in the spirit of open source hardware.

Like open source software, open source hardware projects are unencumbered by pat-



Galvez's Arduino-powered indoor garden



A work-in-progress original Wi-Fi car that can map floors.

ents and provide users with the source code, schematics and mechanical drawings necessary to copy, modify, adapt or improve any design.

OpenDrone has its roots in an earlier electronics club, the Quadcopter Group, started in 2008 by Ollo Schwan and Daniel Koch, two IT professionals from Germany who met through the Beijing GNU/Linux User Group.

"We made a very good start with pretty basic electronics," says Schwan, a 45-year-old IT manager of GNU/Linux systems. "We didn't just focus

on our own education, but on showing people that they could do these things on their own."

Over the years, the group spoke at several universities about open source hardware and demonstrated its designs, including a work-in-progress quadcopter and an automatic Morse code transmitter and interpreter.

However, the group's activity began to stagnate when several of its core members moved out of the capital.

Galvez and Samuel Huang, an embedded platform developer who had been involved

in the original Quadcopter Group, decided to restart the project and move it from the Dongzhimen area to Haidian District with their friends Tonghui and Du Weihua, two open source hardware fans who volunteered their work space for the first meeting.

That meeting attracted numerous new participants from the local IT community, including Bobo Zhuang, the co-founder of DFRobot, a Beijing-based company that develops and manufactures open source hardware for hobbyists.

Zhuang was so taken with the project that he completed the frame and motor controller for the group's first new quadcopter on his own and began opening the DFRobot office for its meetings in February.

Unlike many IT-related groups in town, OpenDroid's meetings are lively and talkative, drawing crowds of six to 10 people from varied backgrounds.

The group's next step will be developing a new flight controller for its quadcopter using an ARM Cortex-M3 CPU, Huang says. The part will be used to ensure their quadcopter flies level and stable, compensating for gravity and wind.

"[These] open source hardware projects ... are important because they give people with low incomes and little access to education a valuable chance to learn," Schwan says.

And that's why Galvez sees China and hobbyist electronics as a perfect match.

Pre-assembled controllers like the Arduino are comparatively expensive in Europe and the Americas, he says. What could cost as much as 40 euros can be purchased in China for as little as 125 yuan. The difference in price becomes even more pronounced when shopping for simpler things, like chips, capacitors and resistors.

"If more people can have access to this kind of information, it would be so good," Galvez says. The basics, he says, are simpler than they appear and can empower people to solve problems and build simple machines to improve their lives.

"[Electronic design] is just a way of interfacing the cyber world with the real world."

He plans to organize a robot battling competition to promote hobbyist robotics and open source hardware in the capital.

But while battling robots may be cool, open source hardware is about grander goals.

"Robots are just what make people talk. The real thing is understanding that the little board you have in your hands is everywhere in your life. And you can do just about anything with it," Galvez says.

The only limit is imagination.

Meeting information:

When: Thursdays at 7 pm

Where: Room 2204, Building 7, Jinqiu Homeland, Haidian District

Email: opendrone@googlegroups.com