Applying for project No.6:

" Development of a DIY robot kit for educators"

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Location: Patras, Greece
Time zone: GTM+3 (Summer Time),

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- IRC nickname on #sugar
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PanKonstantinos

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- Your first language
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`Native language:` Greek
`Other Languages:` English, Spanish (elementary)

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- What is your motivation to take part in Google Summer of Code ?
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It will probably be my last chance to participate in a program like this as a student, if you consider I am pursuing a Master's degree at the moment. So my motivation is to take the chance and create an open source code for the community to use and get young students not only into programming, but rather in science in general. I hope this will be the trigger for many of these students to "get their hands dirty" and become the engineers and scientists of tomorrow.

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- Why did you choose Sugar Labs ?
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I did not know Sugar Labs so far. I have just tried it lately and I believe it's a great window of opportunity for children to learn all kinds of engineering.

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- Why do you want to work on this particular project ?
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I chose this project because of my first degree in Automation engineering, thus I strongly believe I have the potential and skills to complete this particular project. Though, most of all, I really like the idea of giving young students the opportunity to know about coding and hardware with an interesting and playful way, similarly as to how I wish I had the same opportunity when I was in school.

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- What are your expectations from us during and after successful completion
of the program ?
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During GSoC, I expect a weakly feedback and guidance from the mentors so they can supervise the project and advise me for any possible improvements they think this project can have.

After the program, I expect to manage to expand my knowledge in the field and think without the time pressure to improve the robot, make it more complex and provide options and possibilities for more advanced users.

Project Details

– What are you making ?

The project will be a low cost robot kit for educational purposes. The robot should be multipurpose and cheap, so that it can be accessible to everyone, from absolute beginners to intermediate users.

I also believe that it is of great importance to have a modular structure in order to start from a simple motion and manage to complete more sophisticated tasks. The main idea is to have multiple sensors and combine them, so that it can be flexible for many applications.

This robot –among others- will be able to:

- – Avoid obstacles,
- – Follow lines,
- – Find a way out of a maze,
- – Illuminating in the dark,
- – Grab and move things around etc.

– How will it impact Open Technologies Alliance(GFOSS) ?

This project will be available to individuals who could not afford a commercial robot kit so far. This way robotics can reach even more children and get them to know the excitement and joy of creating.

Furthermore, there will be some courses for public use in order to give parents the chance to learn among with their children.

– What technologies (programming languages, etc.) will you be using ?

As for the main board, I was thinking about using an Arduino Uno -or a clone of it- in order to keep the cost low and have a wide example library from the internet for future use.

The programing environment will be the Arduino IDE, and I want to develop a new library of functions just for this project in order to simplify the coding process even more for the students.

Considering the sensors, in the table below with the first sensors that come in mind for this purpose.

Material	Purpose 1	Purpose 2
Ultra-sound (x1)	Obstacle avoidance	Distance measure
IR Sensors (x3-5)	Line follower (Vertical)	Wall follower (L/R side)
Micro-switch (x2)	"Touch" sense	
DC-motors (9-12 V) (x2)	Movement	
Mini-Servo (x2)	"Head" tilt	Grippers open/close
Photo-Resistors (x2)	Light level	

- Break down the entire projects into chunks and tell us what will you work
on each week.

A brief schedule is the following for completing the project in time.

#WEEKS	DETAILS
WEEK 1-3	Discussion with the mentor and gathering of the materials. Also making a strategic plan for the code and 3d design.
WEEK 3-5	Hand on the sensors, testing and validation. Creating prototypes from cardboard for tests
WEEK 5-7	Bug testing/Improvements
WEEK 7-9	Designing an educational course (examples)
WEEK 9-11	Building of the final assembly
WEEK 11-13	Hope to have some time to embed more features.

*Hope there will be some time at the end to add some more complex features