



Yash Mathne <yash6866@gmail.com>

GSoC : Gamepad Project

9 messages

Yash Mathne <yash6866@gmail.com>
To: tony@raisingthefloor.org

11 March 2020 at 13:55

Hi Tony,

I hope you and your close ones are safe amidst the outbreak and its effects. I thought I'd email you directly but if you prefer that I continue using the mailing list I will proceed in that fashion in the future.

Regarding the gamepad project, I am very interested in this venture as it aligns with some work I have done in the past with using Arduino based solutions to help the disabled community. I am in the process of writing a case study like you've directed in your project prompt. I am focusing on the current solutions such as the keyboard and gaming controllers (trying to obtain one for the same) as a means to interact with the browser and the content we view in them. However it would help immensely to know what sub-community we would be primarily targeting as the end users for this project. While we will work on a flexible solution that can accommodate various groups it would help to first focus on a certain subset and then expand functionality to be even more inclusive.

Apart from this, I wanted to know if there was a scope of maybe changing the project idea a little bit. I was browsing through all the existing solutions and most of them are too expensive or tailored towards traditional users and then repurposed to be more accessible. It maybe pushing it a little too much but given that I have worked with Arduino in the past I was wondering if making an open source design that can be ordered and assembled with ease at under < 50\$ could be a possibility for the project as well. This would allow us for instance to have huge joysticks and buttons for people with motor function disabilities. I would be willing to work on this as a stretch goal beyond the scope of GSoC as well.

Sorry for such a long message, but one last thing, I don't see anyway I could contribute to this particular project apart from the case study and actually working on the project itself at this stage however a lot many organisations have a strict rule about number of prior contributions before applying so please direct me to ways in which I can contribute to maybe make my chances of being able to work with GSoC and the fluid community.

Thank you,
Yash Mathne

Tony Atkins <tony@raisingthefloor.org>
To: Yash Mathne <yash6866@gmail.com>

11 March 2020 at 17:18

Hi, Yash.

I think it's fair to review the draft your proposal one on one for now.

However it would help immensely to know what sub-community we would be primarily targeting as the end users for this project.

I know that scoping the target user base is a big part of most projects, so it's a fair question. My original inspiration was the Xbox Adaptive controller, which I use in my own side projects, and which works with the gamepad API. Although it's certainly a standalone controller by itself, its main appeal is as a means to make highly personalised solutions at relatively low cost. The same applies to the gamepad project, we're making it possible to use keyboard navigation with a gamepad, on the assumption that a huge range of users can take advantage.

Apart from this, I wanted to know if there was a scope of maybe changing the project idea a little bit. I was browsing through all the existing solutions and most of them are too expensive or tailored towards traditional users and then repurposed to be more accessible. It maybe pushing it a little too much but given that I have worked with Arduino in the past I was wondering if making an open source design that can be ordered and assembled with ease at under < 50\$ could be a possibility for the project as well.

I do take your point about price. The Xbox Adaptive Controller is around a hundred dollars, and it's another hundred for the Logitech Adaptive Gaming Kit, which provides a range of buttons and velcro mounts. That seems expensive

until you compare it to adaptive switches, which sell for hundreds per button without even considering the controller that lets you use them with a computer or other device. But it's still a fair point that even 200 is prohibitively expensive for some.

In my own work, I have built custom joysticks using inexpensive USB joystick boards, which are less than 30 dollars typically. These can be connected to inexpensive arcade components, and also work with the gamepad API. These require no coding at all, but act very much like a joystick. However, these can only act exactly like a joystick, and my sense is that your idea is maybe something more.

I guess I would consider using an Arduino or Pi or any other IoT board if it let us do more for less. For example, if an IoT board can be configured to act as a USB keyboard connected to a computer, then it reduces the complexity of what we need to develop, as we only have to get the gamepad integration working on one platform, at which point we have something that can be used across a range of applications on a bunch of operating systems.

I would however encourage you to think beyond Arduino, and read up on a range of boards, especially those capable of running a headless browser stack or running Javascript natively (See [espresso.js](#)). Although Infusion is not a hard requirement for absolutely everything we do, I submitted the project under this organisation because I believe it makes sense to use Infusion for this project, as it gives people building on our work the most options for configuring and extending our work.

Anyway, although I think it's a good idea to research and flesh out the idea of using an IoT board, you don't have to (and shouldn't) commit to a particular technology quite yet. As part of the project, we would compare the tradeoffs involved. Keep thinking about it, write up your ideas, and get your proposal ready.

Cheers,

Tony

[Quoted text hidden]

Tony Atkins <tony@raisingthefloor.org>
To: Yash Mathne <yash6866@gmail.com>

11 March 2020 at 17:23

Hi, Yash.

Sorry, I had the wrong project in mind, the Javascript board is an Espruino:

<https://www.espruino.com>

Cheers,

Tony

[Quoted text hidden]

Tony Atkins <tony@raisingthefloor.org>
To: Yash Mathne <yash6866@gmail.com>

11 March 2020 at 17:25

Hi, Yash.

To give you an example of what I meant, here are their instructions about using the Espruino Pico as an external keyboard:

<https://www.espruino.com/USB>

That's the kind of thing I'd like to see for any IoT board we consider.

Cheers,

Tony

[Quoted text hidden]

Yash Mathne <yash6866@gmail.com>
To: Tony Atkins <tony@raisingthefloor.org>

16 March 2020 at 14:59

Hey Tony,

Just a follow up to our previous email communications, as discussed earlier I reviewed the options of using an IOT board to achieve the task in hand, and while what you said is true not only will it make the scope of the project smaller in that we would only have to worry about integrating the IoT board as an input device to replicate a keyboard and a mouse, but also this would immensely increase the accessibility factor from just the browser to possibly using the whole machine. This got me really excited and I started researching how to integrate the entire stack on the board before I hit the roadblock while ordering. The purpose of this project as I see it is to easily enable access to the web however the IoT board approach will require a lot of technical setups and this could prove to be counterintuitive as it wouldn't allow the technology we develop to be used by more people. I also realized why you proposed IoT boards instead of Arduino like I had suggested and while I completely agree that IoT boards are the way to go if we decide to pivot to a full-stack hardware + software approach at this, I am not sure if that would fulfill the basic goal of this project, ie, increasing accessibility.

As for the original scope of the project, I am writing up a proposal right now, would you like me to include my why I think the hardware approach isn't the way to go?

On that note, here is my detailed breakdown where the keyboard as a sole input source fails and could be improved with a joystick input;

Link - <https://medium.com/@yash6866/alternative-input-methods-e9bcfe60a006>

I have also made a chrome extension that detects when a controller is connected and shows which button was pressed as a proof of concept. I haven't written it with the best coding practices as I was trying to get a prototype out for you to see, but I will adhere to proper coding standards for my projects.

Demonstration - https://youtu.be/y7Jr-w_nfuc

Link to Code - <https://github.com/yash-mathne/TestExtension>

I have further figured out the workaround to the Javascript security restrictions of not being able to control the mouse by using the cursor library in conjunction with a scope bound which will allow us to traverse the screen and access links over the cursor is hovering. We can also simulate other functions such as on hover actions or scrolling by adding functions to the cursor as well.

Looking forward to hearing from you.

Thank you,
Yash Mathne

[Quoted text hidden]

--

Yours Sincerely,
Yash Mathne

Tony Atkins <tony@raisingthefloor.org>
To: Yash Mathne <yash6866@gmail.com>

17 March 2020 at 13:25

Hi, Yash.

Thanks for the demonstration and for researching the options to simulate mouse activity.

I still think an IoT board should be one of our candidates at least until we rule it out. As an example, the Espruino board [supports acting as both a mouse and a keyboard](#), and you would be able to control things other than chrome. It also supports bluetooth, which is more promising when working with mobile.

Speaking of which, have you been able to try out your proof of concept with Chrome on a mobile device? Very curious to see what the options are there.

Cheers,

Tony

[Quoted text hidden]

Yash Mathne <yash6866@gmail.com>
To: Tony Atkins <tony@raisingthefloor.org>

17 March 2020 at 21:05

Hey Tony,

That makes sense however I would it not be a better idea to move the scope of the project from using gaming

controllers as a navigation aid in browsers to using them as a navigation tool across the OS for different OSs. Right now there exists an application on windows already that allows you to use a controller as an input device, but none for Linux or Mac environments. I am not opposed to the idea of an IoT board and in fact, think given the specific board and HID module you've highlighted, it makes work on the development end much much easier. However, what I can't get behind is how making a device that requires assembly from the end-user help in increasing the accessibility for the end-user? Unless this project is intended to be a proof of concept on what is possible to do, I don't see how that would help. Sorry if I come off as too dismissive of this idea after having suggested it myself but I had this query and I thought I would get that cleared off.

That being said, I will include an alternate project proposal and the timeline for challenges we would face while developing using the IoT board in my proposal as well!

Chrome doesn't yet support extensions on mobile, I can, however, work on a prototype application that would allow us to achieve the same as navigating mobile with gestures such as swiping, pinching, panning is harder to simulate with a traditional keyboard or any sort of binary input device. So a navigation tool that allows us to use mobiles effectively will open up mobile applications to a much wider demographic and given that universal apps are the future and touch inputs like ones present on mobiles will be an expected form of input across the board in the future this could be an exciting project to dive into. Please advise whether I should start working on this front!

(TLDR: A navigational tool that allows us to simulate various touch-based gestures on a more traditional joystick based input structure whether that be via IoT boards or a controller)

[Quoted text hidden]

Tony Atkins <tony@raisingthefloor.org>
To: Yash Mathne <yash6866@gmail.com>

18 March 2020 at 18:10

Hi, Yash.

Good observations. I look forward to reading your draft proposal.

Cheers,

Tony

[Quoted text hidden]

Yash Mathne <yash6866@gmail.com>
To: Tony Atkins <tony@raisingthefloor.org>

18 March 2020 at 22:23

Thanks for the feedback!

I have attached a draft proposal for the main idea, please advice on what you think I should add so I will make a similar proposal for the other ideas.

[Quoted text hidden]

 **Proposal_1.pdf**
127K