CM2306 Spring Semester Individual Coursework

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**What am I proposing?**

The plugin that I am proposing helps developers who are working on internet of things devices such as Amazon Echo Shows or the Google Nest hub max. These are all smart speakers with built in assistants and a camera that are connected to the internet. This makes them all Internet of Things Devices (See slide 5 from “Lesson 1-Applications and Use Cases” lecture slides). One problem that some people have with these devices is there is now way of knowing when the device is recording video of you. My plugin would automatically add code to turn on a small LED or something similar whenever the developer turns on the camera. This will make it more obvious when the camera is on and will help the user of the device know when the device is watching them. This plugin mainly tackles the Right to Assemble discussed by Wright and Raab (2014) (see slide 11 from “[Activity Based Learning 1-Introduction to Privacy by Design Schemes](https://learningcentral.cf.ac.uk/webapps/blackboard/execute/content/file?cmd=view&content_id=_5321344_1&course_id=_393268_1)”).

The one problem with having plugin would be that a developer could go in and alter the code to take it out, so the LED doesn’t light up, therefore negating the user’s privacy. This could be changed so that the code is permanently locked. The other draw back to the plugin, is it would require all manufactures to include an LED for such purpose which would make older models more susceptible to invasions of privacy.

**How does my proposed plugin make the Internet of things application development process easier?**

My plugin can make the development process for smart speakers and assistants, such as the devices made by Amazon and Google easier by reducing the human error. As said by Solovjov (2016) “even better than lists is removing the need to remember something in the first place” and “Every time there is a pattern to the actions you have to perform, make the computer do it for you.”. Here Solovjov discusses automation and taking the pressure of remembering to do a task and place it onto the computer. This is what my plugin would do. Instead of the developer themselves having to remember to code to the small LED on the computer would automatically do it whenever the specific code is written.

Another way that my proposed plugin can make the development process easier is by support older versions of the devices. This is a very simple task, but it can save a lot of time. If the creator of the smart speaker were to implement something along the lines of having an LED turn on when the camera was on, but without using my proposed plugin. The developer would need to back through all the code and add in the code for the LED, into each place where the camera turns on. On the other hand, a developer using my proposed plugin would just need to turn the plugin on and allow it to do its job, and the code would automatically be added. This saves a lot of time for the company and the developer letting them get on with other more important tasks

**How does it help protect privacy?**

**How feasible is it to develop my proposed plugin?**

One of the main flaws in the feasibility of developing my proposed plugin is it requires the manufactures of the smart speakers to add in a small LED or similar to their product. At the moment, none of the big three makers of smart speakers (with a built-in camera), Amazon or Google have an LED that could be used. This would mean that even at a later date if they did add on an LED the older models couldn’t use this plugin and would still have no indicator for when the camera is on.

Another flaw of the plugin would be the language that the developer writes each smart speaker in. For example, the Amazon Alexa is written in Node.js while the Google home Assistant is written in C++. These two styles vary at lot, each with different syntax and styles of coding. This means that for my plug in to be uniformly accepted people would only need to write in one language, unless the plugin was ported to be used in multiple different languages.

Another problem with developing my proposed plugin is you would need to be able to lock the code for the LED so the developer can’t just take it out. After a search on the internet I was unable to find a way to do this and as such would probably need to develop another method.

**How does my plugin compare to other existing Internet of things development tools?**

**References**

* Charith Perera, “CM2306 Lesson 1-Applications and Use Cases”, Cardiff University Lecture Slides
* Charith Perera, “CM2306 [Activity Based Learning 1-Introduction to Privacy by Design Schemes](https://learningcentral.cf.ac.uk/webapps/blackboard/execute/content/file?cmd=view&content_id=_5321344_1&course_id=_393268_1)”, Cardiff University Lecture Slides
* Solovjo, M. 2016. Human Error in Programming. Available at: <https://medium.com/@maksimsolovjov/human-error-in-programming-33e4c8be59c3> [Accessed: 31st March 2020]