

CAUSES OF ENERGY CONSUMPTION IN MOBILE DEVICES AND SUGGESTED SOLUTIONS

Mustafayeva N.A.

Mingachevir State University, Mingachevir, Azerbaijan

Nowadays, smart phones have become an integral part of our lives. Their use is increasing and almost everyone uses it. As everyone knows, these smart phones operate with a specific energy source. Currently, one of the biggest problems is that the energy storage capacity of smart phones is decreasing day by day. Sometimes, due to a lack of energy at a very important moment, our work is interrupted or not completed at all.

The aim of the paper is to talk about the reasons for energy consumption on Android devices and how to eliminate them.

1. One of the reasons for energy consumption in mobile devices is that the screen is too bright. A screen that is too bright increases energy consumption. So, keep the screen brightness in auto mode. Thus, your device will automatically adjust the brightness of the screen according to the light.

2. A second reason for energy consumption is that account synchronization is left on. Turning off account synchronization causes a significant reduction in device power consumption. Account sync is triggered each time mobile data is enabled and runs as a background process on the device. It continues as long as the Internet is active. This causes serious energy depletion. If you turn off this feature, you will have to check email or other programs manually. Also, apps like WhatsApp will not automatically copy chats. But in return, the energy consumption of your device will decrease and you will be able to use the device comfortably for up to 1 full day.

3. Another reason for energy consumption in mobile applications is that functions such as Wi-Fi, Bluetooth and GPS remain open. Functions such as Wi-Fi and Bluetooth are always active when they are on, so they consume a lot of energy. Therefore, keep these functions off when not in use, keeping them off when not in use will increase battery life.

The GPS system is the main source of energy consumption in smart devices. Because currently, almost most programs can work with the GPS program on the phone. At this time, the number of processes in the background increases, location search through GPS is always provided. Therefore, too much energy is spent on this process. Therefore, if you are not using map applications, it is recommended that you keep the GPS settings turned off.

4. If you don't close the programs after you are done using them, the program will always run in the background. This increases energy consumption. When you close the programs after you are done, those processes stop. Only the processes of system programs remain behind, which leads to less energy consumption than before. Therefore, it is recommended that you close the programs running in the background.

In addition to what we have listed above, you can save energy in your device in other ways. One of them is to set the number of processes running in the background from the "Developer Options" section on the device. As you know, background processes are constantly consuming energy. The smaller their number,

the more energy savings you can achieve. But it is worth noting that if you reduce the number of background processes, the program will not be active after exiting many programs. All you have to do is log in and see again to verify your accounts.

Use power saving modes if available on your device. This will help drastically reduce the power consumption of your device. These features automatically close background processes when enabled and prevent them from restarting until you touch the device. With these functions, the duration of the daily energy capacity of the battery is also increased. In addition to all this, you can use additional programs. You can close background processes with programs like Task Killer. Thus, only the processes of system programs remain on the device. You can search and download them from the market. It is very convenient to use. And finally, let's note that another reason for energy consumption in smartphones is that we don't completely exit from other programs that we use very often, such as Facebook, Instagram, Twitter and WhatsApp, when we close them, they work in the background and consume the device's energy. Instead of closing these programs one by one, we recommend using a program that automatically exits such programs running in the background.

References

1. Vasile C. V., Pattinson C., and Kor A. L. Mobile phones and energy consumption. *Green IT Engineering: Social, Business and Industrial Applications*, Springer: – 2029. p. 243-271. DOI: https://doi.org/10.1007/978-3-030-00253-4_11
2. El Outmani, A., Jaara, E. M., & Azizi, M. Literature Review of Energy Consumption Modeling for Mobile Devices. In International Conference on Advanced Intelligent Systems for Sustainable Development. *Cham: Springer Nature Switzerland*: – 2022. pp. 99-112.

ОСОБЛИВОСТІ ВИКОРИСТАННЯ VIVADO HLS В КОНТЕКСТІ ПОБУДОВИ АЛГОРИТМІВ ОБРОБКИ ЗОБРАЖЕНЬ

Філіппенко І.В., Корнієнко В.Р.

Харківський національний університет радіоелектроніки, Харків, Україна

Питання скорочення часу проектування користувацьких IP ядер з метою реалізації блоків апаратного прискорення та прототипування нових алгоритмів є актуальною проблемою з науковою та інженерною складовою. Однією з найважливіших складових є вибір частини алгоритму що буде реалізовуватись та особливостей паралелізації імплементації, що у випадку обробки зображень є доцільним шляхом прискорення[1]. Зокрема, слід визначити що побудова оптимального шляху обробки з метою запобігання пропуску кадрів і забезпечення низької затримки між вхідним та вихідним кадром є одними з головних критеріїв оцінки в подібних рішеннях.

Метою доповіді є дослідження можливостей Vitis HLS для побудови системи обробки зображень з підтримкою декількох різновидів алгоритмів.

В доповіді наводяться результати вимірювань latency для використання передачі даних між блоками, розподілу трафіку з використанням DMA та AXI-FIFO буферів для пересилання даних між апаратною та програмною частиною.