Qualcomm Developer Project HelmetDetect-demo

Project Submission

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| **Attribution:** |  | |
| **Email address** | [zhangzz6687@thundersoft.com](mailto:zhangzz6687@thundersoft.com)  [zhanglei0706@thundersoft.com](mailto:sunzhen@thundersoft.com)  Yuandk0305@thundersoft.com | |
| **Project Title**\* | HelmetDetect | |
| **Images**  *Upload up to 5 images of your project*  *Please submit/send the original JPEG/PNG files for all images included in the document* | **Qualcomm® QCS610 SoC.png**    [Alt tag: “HelmetDetect-demo using The Qualcomm® QCS610 SOC Open Kit ”]  **usb.png**   |  | | --- | | **typc** |   [Alt tag: “using the USB line to develop on Qualcomm® QCS610 SOC development board” ]  **charger.jpg**  charger  [Alt tag: “using round-hole charger to power Qualcomm® QCS610 SOC development board”]  **dpline.jpg**  dpline  [Alt tag: “using the universal DP line to connect LED displayer to Qualcomm® QCS610 SOC development board”]  **LED-Displayer.png**  LED-Displayer  [Alt tag: “using a LED Displayer to display the HelmetDetect-demo interface from Qualcomm® QCS610 SOC development board”] | |
| **Description**\*  *High level description of the project* ***(75 words or less)*** | This project relies on the QCS610 development kit, using the AI computing power and image processing capabilities of the development kit to collect images in real time, perform AI reasoning after preprocessing, and output the reasoning results. I use gstreamer and TFLITE to complete the above functions. When the pipeline obtains valid image data, it will automatically collect the image, perform AI inference, and return the position information for the helmet in the image frame. | |
| **Objective**   * *What inspired you to create this project?* * *What is your desired outcome?* | At present, ARTIFICIAL intelligence has entered many industries requiring worker safety supervision, such as construction sites and open-air factories, and helmets are one of the necessary safety devices for this mode of operation. Therefore, I want to implement a demo to complete helmet detection on embedded devices. | |
| **Materials Required / Parts List / Tools** | Part Name | Link to purchase |
| Qualcomm® QCS610 SOC Open Kit | https://www.thundercomm.com/app\_zh/product/1593776185472315 |
| USB Line | https://item.jd.com/40759941966.html |
| Charger |  |
| LCD Displayer |  |
| Charger |  |
| DP Line |  |
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| **Source Code / Source Examples / Application Executable**  *Link to open source / shareable code repository* | Description | Link |
| Source Code | https://github.com/ThunderSoft-XA/C610-HelmetDetect-demo |
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| **Additional Resources**  *List related links or resources such as websites, videos, presentations, or other materials* | Resource Title | Link or File Name (and provide file) |
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| **Build / Assembly Instructions** | Sample outline:   1. Overall design framework and Test environment construction method.    1. Parse .mate pb configure file    2. Construct gstreamer pipeline according to .mate file    3. Obtain data from the pipeline and perform AI inference    4. Get and analyze inference results    5. Draw and show final image 2. Software Build Instructions    1. Prepare a PC (Ubuntu 18.04) with Yocto Project;    2. Install adb ;    3. Configure the compilation environment according to the release note document    4. Configure the DP display environment    5. Write BB file(<helmet\_detect\_0.1.bb>),Executing the “bitbake helmet\_detect” command generates executable file 3. Start HelmetDetect-demo    1. Copy “HelmetDetect” executable file to project root directory, then “adb push ” whole project file to Qualcomm® QCS610 SOC,ex./data/ dir.    2. Execute adb root && adb shell. Next, enter the HelmetDetect project root directory, execute ./weston\_dp\_client helmet. | |
|  | Sample outline:   1. How does it work?   The running process of demo is relatively clear. After the program runs, the environment initialization of GStreamer and TFLITE runtime will be carried out immediately. Then, the local video stream pipeline will be built and the .tflite AI model will be loaded; After receiving the signal from the pipeline, the captured video frame is transformed into picture frame format, The neural network will infer this frame to get information such as the number of positions of the helmet. | |
| **Usage Instructions** | The Demo running results are as follows：  final result:  result_0 | |
| **Contributor(s) Info**  *Feel free to include headshots!* | Name | Title  Company |
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Filters and Tags for QDN projects page

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| **Platform/Hardware** | CSR 101x/102x Bluetooth  DragonBoard 410c  mangOH Red/Yellow  √ Qualcomm QCS610 SoC | MDM920x LTE for IoT  QCA-402x WiFi/BLE/Zigbee  Qualcomm Robotics RBx Dev Kit |
| **Software Tools** | 3D Audio Plugin for Unity  Adreno GPU SDK  Hexagon DSP SDK | √ Neural Processing SDK for AI  　Snapdragon Profiler |
| **Operating System** | Android  √ Linux  ThreadX RTOS | Ubuntu Core  Windows 10 IoT Core |
| **Cloud Services/Platform** | Sierra Wireless AirVantage  Gizwits Cloud Platform  AT&T M2X  IBM Bluemix | IBM Watson IoT  Microsoft Azure IoT  Amazon AWS IoT |
| **Skill Level Required** | Advanced  Beginner  √ Intermediate |  |
| **Areas of Focus** | 3D Printing & Modeling  Alexa Voice Service  √ Artificial Intelligence  Bluetooth  √ Computer Vision  Digital Signage  Education  √ Embedded  Gaming | Healthcare  √ IoT  Robotics  √ Security  Sensors  Smart Cities  Smart Home  Toys |

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