With the ever-increasing number of smart and portable devices, powered by mobile operating systems such as Android, it is expected that more complex tasks can be executed in these devices with good response time (due the often good processing capabilities) and energy-efficiency (due most of these devices are battery-powered). Regarding image and video processing, existing applications use external servers to perform the high-cost computations and use the device to capture, send, receive and display the information.

Approximate Computing is a modern design paradigm that aims to exploit the inherent resilience to errors in a wide set of applications. By bringing good enough results in applications such as image processing and financial analysis, where a unique or golden answer does not exist. Approximate Computing techniques can improve performance in terms of execution time, area, and power/energy, even by orders of magnitude. This can be done, e.g. skipping non-critical computations at software level, reducing circuit complexity or lowering the operation voltage at hardware level.

With the implementation of Approximate Computing software techniques in these types of applications, significant reductions in execution time and energy consumption might be achieved, performing the application on an Android-powered device rather than in external servers where a reliable communication channel is needed.

**Goal:**
Design approximate image processing applications such as face detection and people counting in images in an Android-based Internet of Things (IoT) device.

**Required skills:**
- C++/Java programming

**Helpful skills (not required but helpful):**
- Android development
- Image processing algorithms

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Fig 1. Face detection in images (The Big Band Theory cast).