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.

In the Internet of Things (IoT) era where we live in, ever-increasing information from sensors is processed by smart devices, many of them powered by mobile operating systems such as Android, to bring useful information and take decisions. Currently, techniques such as sensor fusion and Kalman filters are use to determine position and movement with information from accelerometers, magnetometers and gyroscopes.

Using Approximate Computing techniques one application can be develop to determine the position and movement of persons or objects, reducing the required computation effort while producing acceptable results, without depending of global positioning systems (GPS).

Goal:
Design an approximate algorithm for motion tracking using information from sensors, such as accelerometer, gyroscope and magnetometer, in an Android-based IoT device.

Required Knowledge:
• C++/Java programming

Helpful skills (not required but helpful):
• Android development
• Signal processing

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