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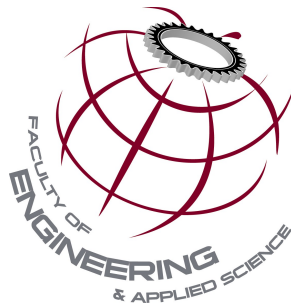
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# Computer Architecture of Wearable Technology (Draft)

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# Executive Summary

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# Table of Contents

<b>Executive Summary</b>	<b>i</b>
<b>1 Introduction</b>	<b>1</b>
<b>2 Smartwatches</b>	<b>2</b>
2.1 Apple Watch Series 5 . . . . .	3
2.2 Fitbit Charge 3 . . . . .	3
2.3 Garmin Forerunner 235 . . . . .	3
<b>3 Virtual/Augmented Reality</b>	<b>4</b>
<b>References</b>	<b>I</b>

# 1 Introduction

Wearables as defined by Technopedia are technologies that are worn on the body that contain various sensors that can record health and fitness information, or take movement input data in real-time [1]. The market for this technology has expanded rapidly in recent years, with the wearable market being worth \$19 billion in 2015, and expected to expand to \$57 billion by 2022 [2]. This growth rate can be attributed to the fact that it is a novel technology just getting past the early adoption phase, but this technology is also improving at an impressive pace each year. The 2010s have seen advances in lower-powered processors with a smaller footprint that allow wearable devices to become much more powerful. With improvements in small, powerful processors, it allows wearables to have more functionality, and focus less on designing the wearable around the electronics inside [3]. Clearly, this demonstrates the design requirement for low-power and small components to architects of wearable technology.

While there are many types of wearables on the market in present-day 2019, this report will focus on two types of wearable technology: smartwatches; and virtual/augmented reality (VR/AR) headsets and headwear.

## 2 Smartwatches

The most popular type of wearable in 2019 is the smartwatch [4]. Smartwatches are devices worn on one's wrist, equipped with sensors, and in some cases wireless communication capability for syncing data to a smartphone. Some common examples of smartwatches are the Apple Watch (Figure 1a), Fitbit Charge (Figure 1b), and the Garmin Forerunner (Figure 1c), all shown below in Figure 1. These devices are priced quite differently, carry different levels of functionality, and are targeted towards different segments of the population. Shown below in Table 1 are prices for the watches listed above [5] [6] [7].



(a) Apple Watch Series 5 [5]



(b) Fitbit Charge 3 [6]



(c) Garmin Forerunner 235 [7]

Figure 1: Smartwatches discussed in this report.

Table 1: Smartwatch Prices

Watch	Price
Apple Watch Series 5	529.00
Fitbit Charge 3	199.95
Garmin Forerunner 235	319.99

Clearly, these watches come at different price points, target different segments of the market, and of course come with different architectures for accomodating the necessary

features in each model. This section will cover each of the watches shown above in greater detail.

## **2.1 Apple Watch Series 5**

The Apple Watch Series 5 is the newest iteration of smartwatch from Apple Inc., released in September 2019. Priced at \$529, clearly this is considered a higher-end smartwatch, fitting in with Apple's other product lines (iPhone, iPad, and Mac). This watch has all-day battery life, a touch screen, voice call, GPS, compass, and music streaming capabilities, as well as the ability to run thousands of apps from the Apple App Store, made specifically for the Apple Watch [8].

## **2.2 Fitbit Charge 3**

## **2.3 Garmin Forerunner 235**

### **3 Virtual/Augmented Reality**

## References

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