

**Universiti Teknologi MARA**

**IOT-BASED REMOTE SENSOR MONITORING OF  
WATER QUALITY IN SWIMMING POOLS**

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## **ABSTRACT**

Swimming pool maintenance, has become an interesting issue, which need to be dealt with. Now in Malaysia, monitoring the water quality of swimming pool is done manually which physically going to the swimming pool and collecting sample of water, which are sent to be tested using specific tools. This is a discrete, time-consuming process and an inefficient way. In order to automate this process, we are going to monitor the water quality of swimming pool remotely. This is done with the help of pH sensor, turbidity sensor, microcontroller, transmitter – receiver modules. The data gathered from the sensors is sent from the transmitter to the receiver, which is then connected to another microcontroller. This data is then sent to Cloud public channel. Finally, the data would be transferred to the mobile devices through Cloud platform.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Background Study

Swimming pool is a structure designed to hold large amount of still water to enable swimmer to enjoy leisure activities involving water. There are two categories for pools which is public pool and private pool. Both of them provide cool and relaxing places for individuals to release their stress and calm their mind (Neal,2010). Unfortunately, much to cause terror of many pool owners, pool maintenance is not usually a fun task. Keeping a swimming pool requires weekly (occasionally biweekly) water testing, pump and filter maintenance, water skimming, chemical mixing and adding acids, chlorine and other chemicals to the water (Neal, 2010). Without maintenance such as this, pools can quickly become unsanitary and unsafe for swimmers.

Pool water need to be in proper chemical balance in order to do the sanitizer process. Proper chemical balance means that the pH, total alkalinity, calcium hardness, turbidity and total dissolved solids must be kept at levels that ensure water is neither corrosive nor scale-forming (Puetz, 2018). Every owner and pool manager should record the chemical level of water in order to achieve the ideal water balance in swimming pool. Sample of water would be collected then pH meter and various of reading equipment are used to determine the water balance of swimming pool. The current methods are time-consuming and would take more cost in order to get the result of water balance.

The Internet is one of the most important developments and Internet of Things (IoT) is the next evolution of the Internet (Evans, 2011). With the capability of gathering, analyzing and distributing the data, Internet of Things consists in the connection between the Internet and range of devices and sensors. Internet of Things have the ability to do more than just connect device to the Internet, they can be a big part of improving efficiency to the human(people) and industrial activity. The Cloud Computing are essential today for