Automatic Infection Detector for Children

Ilboru High School

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Introduction

Children represent the future, and ensuring their physical, socio-emotional and language and cognitive development ought to be a priority for all societies. Children are particularly vulnerable to infectious diseases, many of which can be effectively prevented or treated

The project was done to help children under five years who lose their lives due to infections which weaken their body immunity.

After noticing the global challenge of increased rate of deaths of children under 5 years. It led to my partner and I to make the so called impossible dream into a working existing hand like bracelet for children

Method

Research done by the WHO in 2015 shows that 8 to 13 percent of infants of 2 months of age who have fever have a serious bacteria infection.

The change in pulse rate is key for determining infections especially for children under five years. Its normal for heart rate to be irregular meaning that heart will slow down or it races from time to time but when it beats faster than considered normal for an extended length of time it could sign a problem.

The project comes along with a well-designed mobile app that is going to keep the child's medical records which will help the parents to be aware of the child's hospital visits and contain basic knowledge and ensure that the child's health is given a main priority

Procedure

After gathering much information from the internet we decided it was now time to pay a visit to the highly skilled and experienced pediatricians across the country and we managed to have an interview with Doctor Mwinula who has been a senior pediatrician at Lugano hospital for more than 20 years and he gave his views and opinions concerning infection detection and advised that temperature was key for infection detection ,he supported us fully and advised to visit biomedical engineer for any help in making of the device so we took an initiative to contact an Libero alumni Calvin Marimba studying bio medical engineering at Harvard medical school and he encouraged us to do more research particularly with referral, regional and national hospitals across the country

We visited Muhimbili national hospital and we were able to receive the following statistics concerning the deaths of children under five years

Tanzania's under-five mortality rate is still 1.7 times higher than the world average Tanzania is ranked 27 in the world average with high under 5 mortality rate of approximately between 130 and 150 per 1000 live births (1–3). Throughout the years the following has been the rate annually

2.2SYSTEM COMPONENTS

➢ GSM module
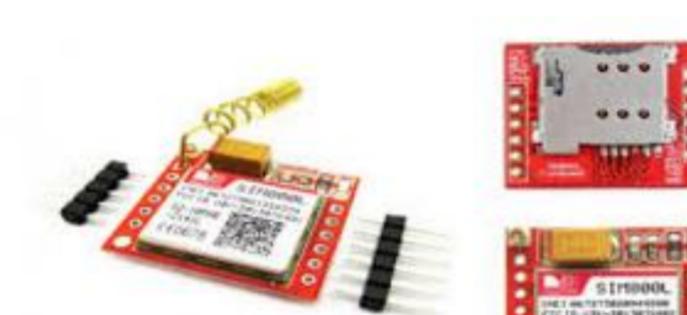
➢ LCD (liquid crystal display)


➢ ARDUINO_UNO
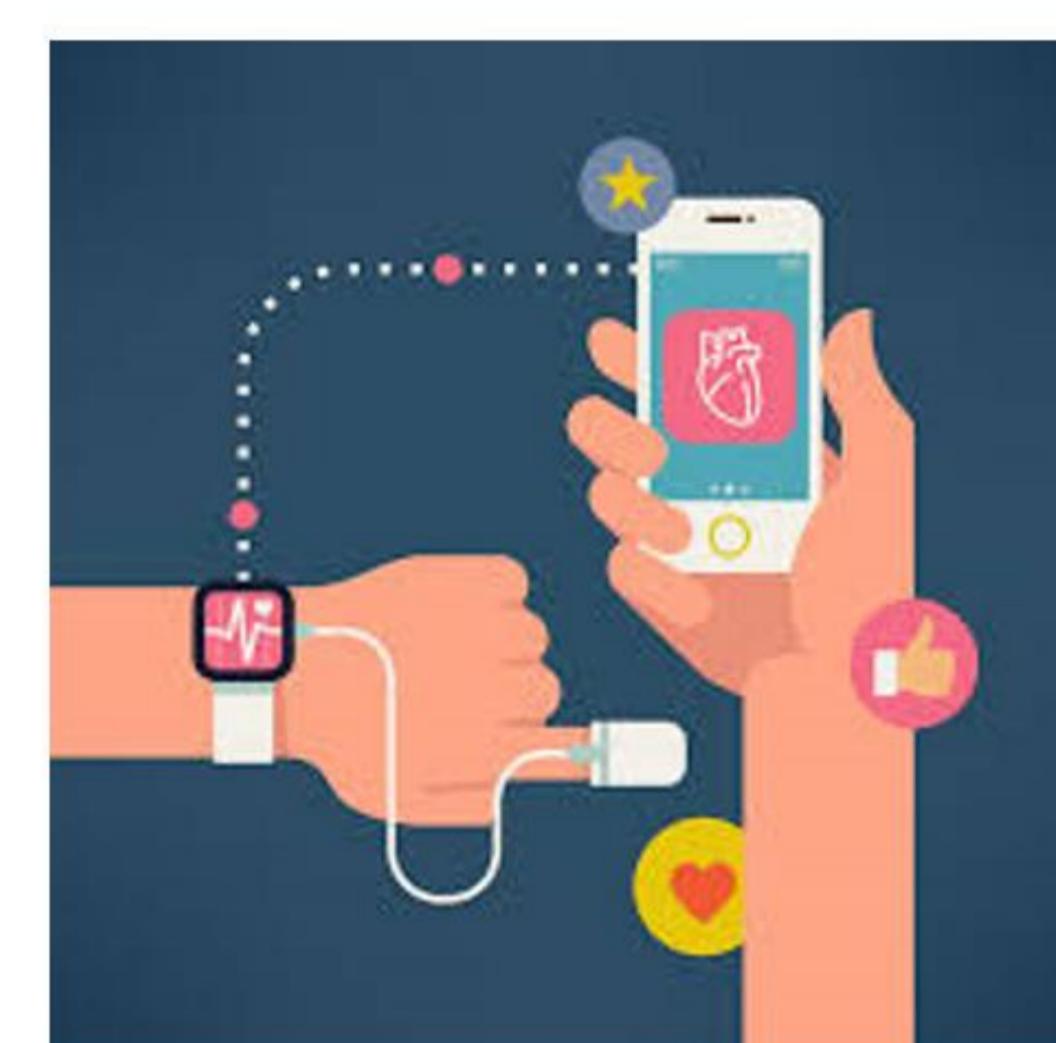
the diagram shows the model on how the device works in detecting infections

Results

We also managed to visit SekouToure referral hospital in Tanzania where we got help from the senior pedtrician Doctor Bahati who classified children under five years into different groups such as those below 1 month , those below 1 year and finally those below 5 years as they are keenly observed in such a way. She commented Neonatal tetanus and measles were important causes of death.

Our main concern was Tanzania but in a large scale sub Saharan Africa before taking a global approach. Sub-Saharan Africa continues to be the region with the highest under-five mortality rate in the world—76 deaths per 1,000 live births. In 2017, 1 in 13 children in sub-Saharan Africa died before reaching her or his fifth birthday—14 times higher than the risk for children born in high-income countries.

Tanzania - Mortality rate

Mortality rate, under-5 (per 1,000 live births)
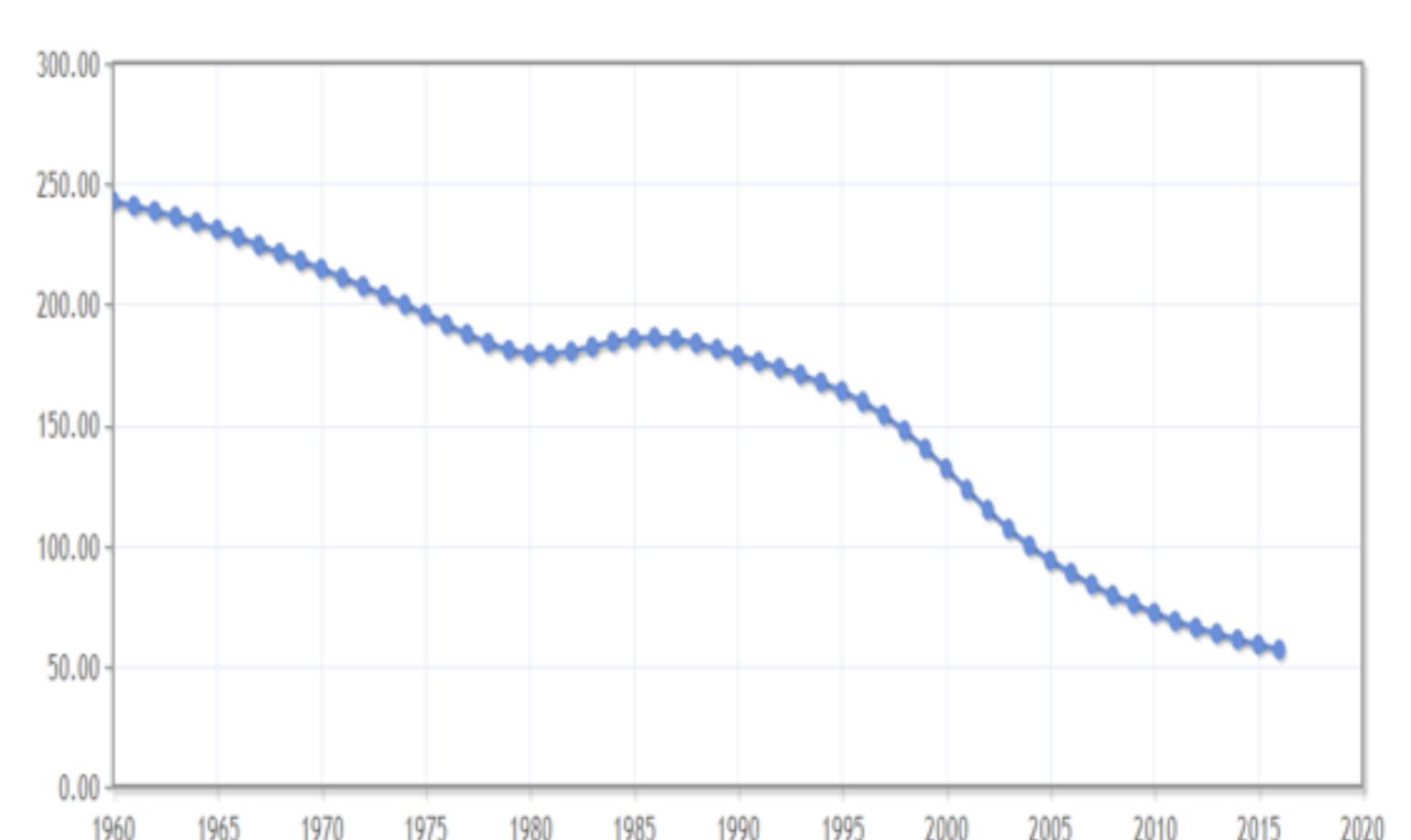
Conclusions

Therefore, the bracelet can detect the early symptoms of infections as early as possible in children and it will eastern early treatment of the child. Though it does not exactly tell what type of infection a child is suffering from but it notifies the presence of an infection by sending costless message followed by a call to a parent and a nearby registered hospital, moreover the mobile app will enable a parents to keep the medical records for their children.

Recommendation

The following are the recommendations to improve the functionality of AN AUTOMATIC INFECTION DETECTOR

i. To reduce the size of the detector by compressing it into a smallest size as possible for easy portability,management and handling

ii. Improve the detection to be able to detect even infections that do not display early symptoms

iii. Generating additional features that will enable to exactly identify the type of infection

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