

Identifying Precursor Warnings of Potentially Fatal Afflictions via Webservice

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1. Healthcare Burden

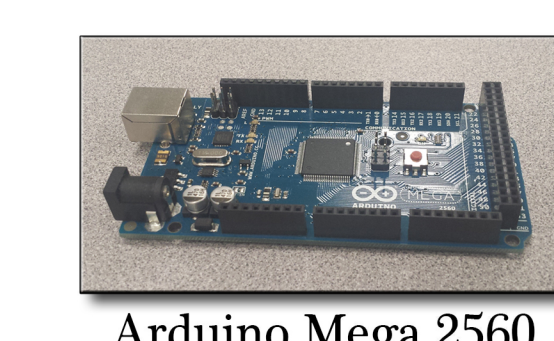
In the case of an elderly patient that requires continuous medical attention, the family of the patient is left with most of the routine day-to-day care. Eventually, the attention demanded by the patient becomes too much for an untrained person to manage. At this stage, the patient would have to be checked into a nursing facility where they can receive constant round-clock care. Even here, trained professionals are not capable of identifying subtle changes in a patient's health the moment they occur.

2. Noticing Subtle Changes

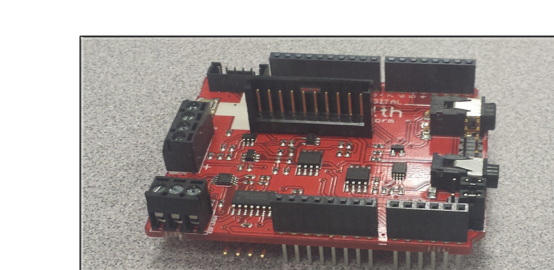
Identifying subtle changes in a patient's health is a key component to a medical monitoring system. Every day, our bodies go through changes. Sometimes these changes are drastic, (i.g. - a broken leg). However, most days, our bodies experience changes too subtle for a human to recognize. Unlike humans, machines can recognize an immediate change in a patient's well-being. Recognizing these changes as early as possible allow the patient to treat their condition before it begins to deteriorate their health.

3. Hardware

An Arduino is a microcontroller and a software suite¹ for programming it.



Arduino Mega 2560



e-Health Sensor Shield



Pulse Oximeter

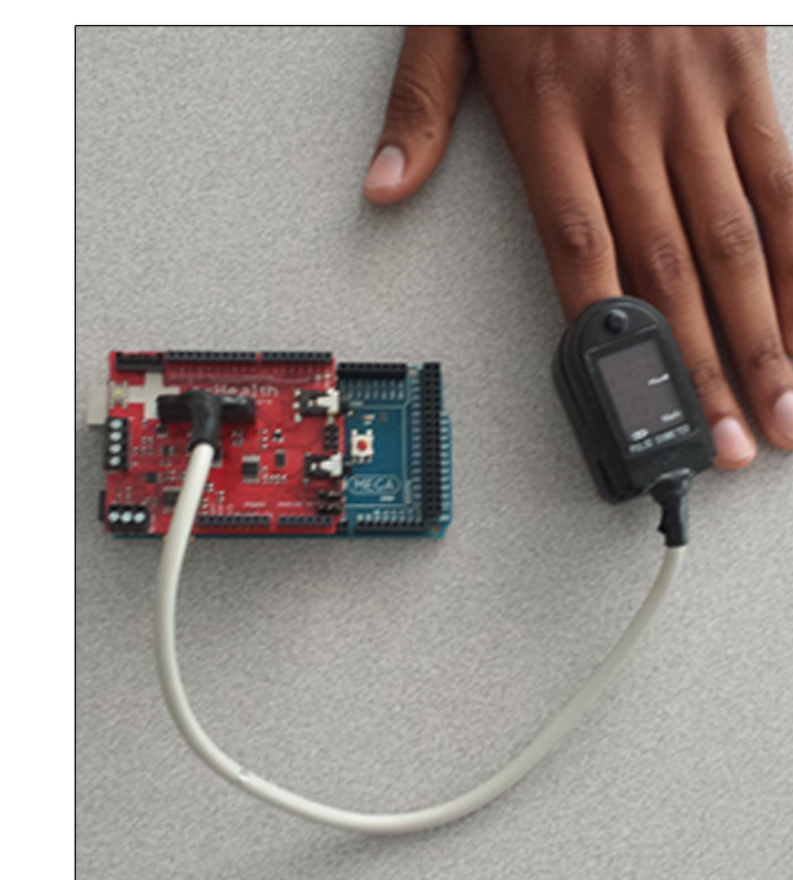
The Arduino Mega is a microcontroller. A microcontroller is a small computer containing a processor core, memory, and programmable input and output peripherals.

The sensor shield allows Arduino users to perform biometric applications where body monitoring is needed.

Pulse oximeters use a **non-invasive**² method of measuring the heartbeat and saturation of oxygen in a patient's blood called pulse oximetry.







1. A software suite is a collection of computer programs, usually application or programming software.

2. Non-invasive - A medical procedure is strictly defined as non-invasive when no break in the skin is created and there is no contact with internal an body cavity.

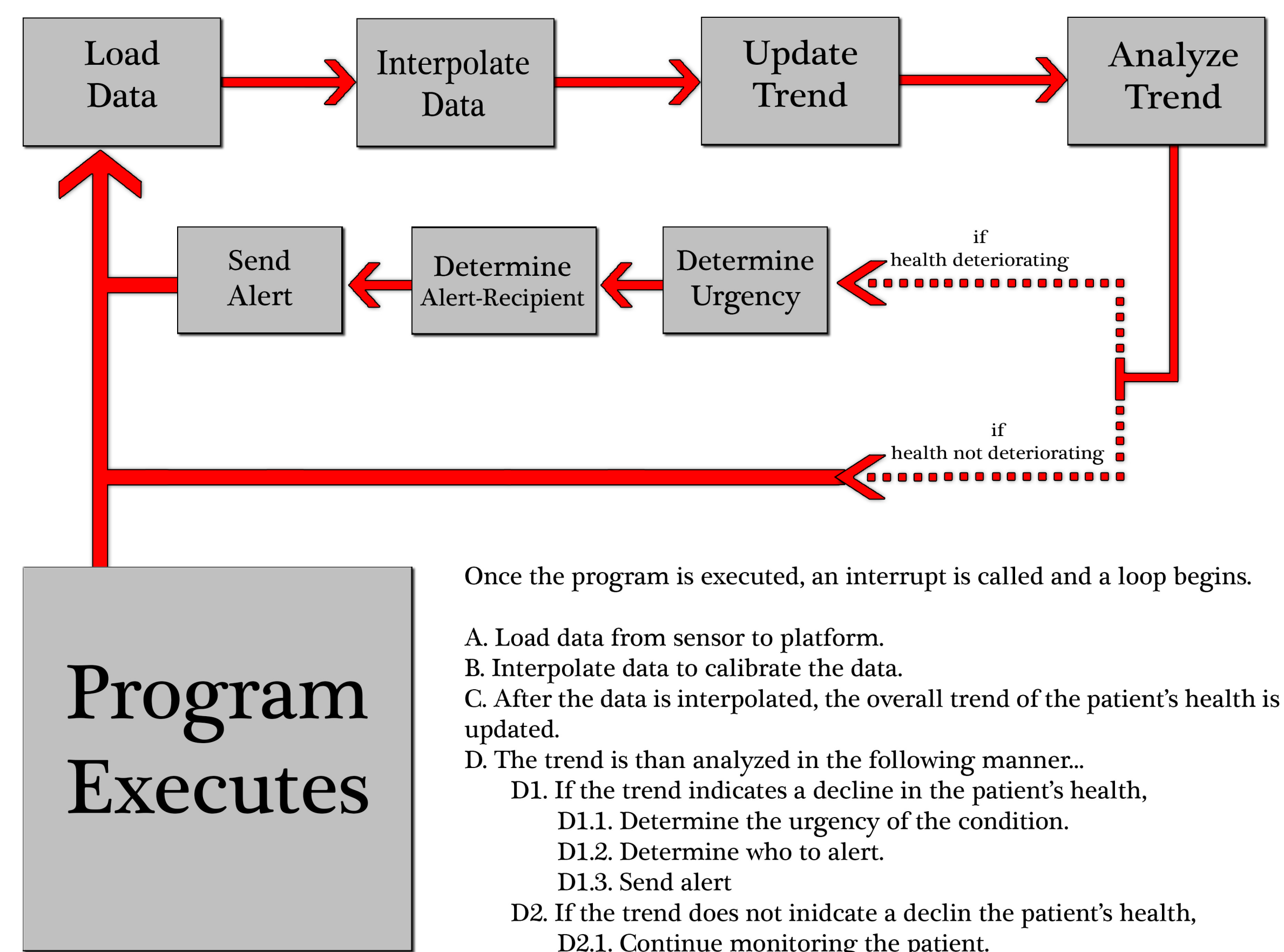


Here, an e-Health Sensor Shield is instrumented to an Arduino Mega 2560 platform. A pulse oximeter is instrumented to the e-Health Sensor Shield to allow data to be read to the Arduino Mega 2560. A USB cord is connected from the 2560's USB port to a computer, where data is analyzed.

4. Operational Concept

1. Patient instrumented with sensors. 
2. Sensors interfaced to arduino 
3. Arduino reads data in from sensors. 
4. Computer extracts data from arduino 
5. Data analysis via Java. 
6. Send alert via Internet. 

5. Software Algorithm



6. Server Architecture

