

# **Bubtech: Micro-Nanobubble Wound Healing Device**

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### Introduction



Micro nanobubbles of oxygen in a fluid solution provide a new and less expensive technology that can promote the would healing process, remove necrotic tissue and delivery oxygenated fluid, with a very low risk of infection and low cost., which surpasses its predecessors in ability of treating diabetic foot ulcers.

### **Current Progress**

The basic model for the current condition of the portable devices has been built. Most of our components, have been connected for both electrical and mechanical parts. At this point, we are trying to work out the cycle control code. For the future development of this device, the Bluetooth function will be included.



### Hardware Design

#### 1) Air Compression

Micro-nano bubbles are generated by sheering in a gear pump and fed to patients through air compression.

#### 2) Vacuum Pump

Negative wound pressure therapy is performed by utilization of a vacuum pump. **3) Negative Pressure** 

Device utilizes negative pressure feedback to ensure the device operates properly.

### ΘŦ ARDUINO Software Contro





## **Software Design**

An Arduino UNO and relays are used to control the solenoids and read data from the sensors. The Arduino UNO will be coded to process feedback from the sensors and control the solenoids accordingly. Furthermore, an app will be created to allow the machine to be controlled and adjusted through Bluetooth low-power.



Fall 2018 ---- Update the schematics. Finish the wiring and integration. Implement Arduino code.

Winter 2018 ---- Build feedback control system. Implement Bluetooth. Develop an Android application. Test and debugging



### **Time Line**

2019 ---- Apply for patents. Conduct trials on animals by using Bubtech. Submit a 510(k) premarket notification.

2020 ---- Conduct clinical trials.