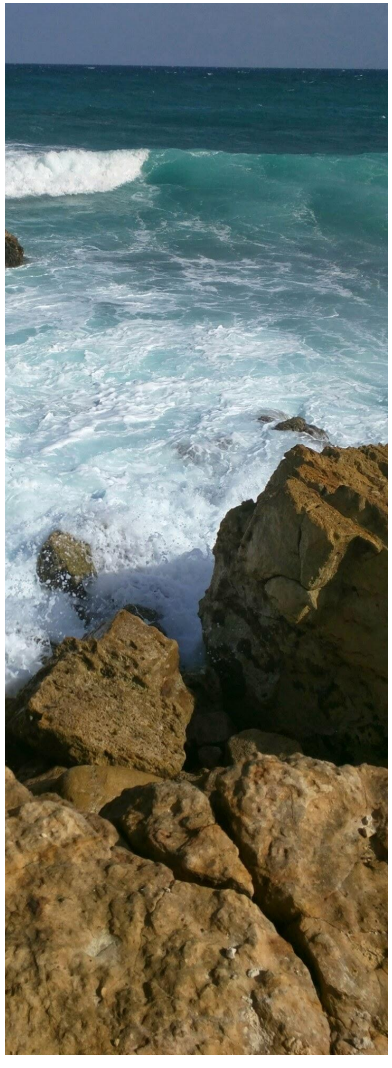

HydroWatch

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https://c1.staticflickr.com/6/5607/15322639400_901a82b3c1_b.jpg

What is hydration and why does it matter?

https://images.agoramedia.com/everydayhealth/gcms/The-Health-Benefits-of-Water-722x406.jpg

Introduction

- Many different wearable devices (ie. Fitbit, Apple Watch)
- Prevention of dehydration essential
- Not currently feasible
- Propose the construction of a wearable device that:
  - Communicates a relative level of hydration
  - Advises the user when to drink water.

Problem Description

- Humans can only survive for a few days without water, which is required by our organs for operation.
- Currently there are no noninvasive practical wearable systems that can provide information about hydration levels to a user.
    - The general population of people do not know how to assess their own hydration level.
- We seek to design a device that will inform a user when a drop below an established level of hydration is noted.

Proposed Solution

- Detection of hydration through the use of LEDs
- Processing data and producing an indicator based on results
- Alerting user to their hydration levels

Demonstrated Features

Show optics measurement on two separate phantoms

- Demonstrate that LEDs turn on
- Construct phantom for testing
- Detect and measure light at photodetector
- Convert the current to a voltage and pass it to the microcontroller
- Analyze data on microcontroller and export as text file for graphing
- Produce an alert to the user

Demonstrate above features on human test subject during rehydration

Available Technologies

- **AFE4490 microcontroller** (3) ~$20 each
- Multiple LEDs (near IR and IR) (6) < $1 each
- Photodiodes (3) ~ $1 each
- OpAmp ~ $5
- Wearable band ~$10
- Python or MATLAB
- **RSL10 Bluetooth** ~ $10
- Circuit board ~ $50
- LCD screen for results ~ $3
- Evaluation board for RSL 10 and AFE4490
- Phantoms (2) ~ $20

Engineering Content

- Communication to LEDs - AFE 4490 communicating with LEDs
- Photodiode measures the light present
- Measuring photodiode response at microcontroller
- Processing data - converting measurements into comprehendible graphs/data
- Create program to display information to user

3 MICROCONTROLLERS.

5 HUMANS.

1 PROJECT. 6 LEDS.

2 PHANTOMS.

- Some other stuff .

1 HYDRATED INDIVIDUAL.