**Objective**
- Combining skin conductivity and heart rate measurements to detect human’s physiological changes due to nerve effect.

**Background**
- People’s skin conductivity varies when their nervous system activated
- Stimulus triggers sweat in the sweat gland
- Skin conductivity drops when people are nervous

- Heart rate has its own rhythm of beating, but it can respond to stimulation of nerves.
- Heart rate increases when people become nervous or influenced by circulatory substances, like adrenaline

**Measuring Methods**
- Measuring skin conductivity
  -- designed amplifier circuit to measure the voltage difference across two fingers.
- Measuring pulse rate
  -- Attached ECG pads (Supplied by Professor Dennis Claflin) to left arm(+), right leg(-) and left leg(reference) to measure heart rate
- Designing IIR low-pass filters for skin conductivity and pulse rate signals (both in DC voltage) with sampling rate of 1kHz
- Algorithms
  -- Updating heart rate at each heart beat and determine the average of skin conductivity at the same time
  -- Calculating the change of vector [(Heart rate) (Skin conductivity)] to determine the physiological changes

**Results**
- Human’s skin conductivity stays relatively constant when not stimulated
- Skin conductivity changes while people is nervous or stimulated
- Skin conductivity curve may change due to variation of human body’s contact area with the probe.

- Skin conductivity has obvious variation when stimulated. It is quite easy to tell physiological changes with the help of calculating the standard deviation.

**Future Work**
- Integrating respiration and blood pressure measurements for further investigation on human’s physiological changes
- Figuring out a much more accurate way of combining polygraph measurements to determine the threshold of psychological fluctuation

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**Objective**

**Background**

**Measuring Methods**

**Results**

**Future Work**