

## **Ryan Abraham**

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### **Energy scavenging from the human body for powering prosthetics**

Ryan Abraham & Tina Smilkstein

Our research centers on extending battery life of electronic prosthetics by constantly recharging their batteries with energy scavenged from the body. There are many projects in existence where energy has been scavenged from the body by using knee and elbow joints to bend a piezoelectric material, but, in the case of someone that requires the use of a prosthetic, this is not a solution simply because there may not be a knee or elbow joint to scavenge the energy from. We have therefore limited our scavenging techniques to those that only require a person to have body heat and to be breathing. In the project presented here, we gather energy from breathing to recharge a cell phone, a system that mimics the battery system that may be found on electronic prosthetics. The breathing apparatus converts the mechanical energy to electrical energy at a rate of between 10-100mW. That power is then stored and transformed through a boost or step-up converter to the voltages required to power a device. This will enable a cell phone, in average use, to last an additional 65% longer.