Efficient and Resilient Wireless Link for Biomedical Implants

Published date: May 2, 2017

Technology description

Executive Summary
Originally developed for neural implants in monkeys, this invention allows for in vivo wireless data and power transmission as minimally invasive as possible. By removing wires penetrating through the skin, the possibility of infection and inflammation are greatly reduced and is all-around more comfortable for the subject. Additionally by increasing the area responsible for power and data transmission and improving coil alignment, the product is safer and more efficient than current technology.
Description of Technology
Current implants utilizing wireless data and power transmission include artificial hearts, pacemakers, and chronic illness monitors. Many implants requiring large amounts of power utilize coil pads on either side of the skin to transmit power, but are high risk to misalignment and high power densities – both of which may irritate or even burn the skin of the subject. Instead, MSU researcher have improved coil alignment and reduced power densities by looping a coil around a subject’ s extremity and using a collar or band as the external component to provide power and receive data via inductive coupling and OOK (on off keying) using radio frequencies. By doing so coils are far less likely to be misaligned, resulting in a safer and more efficient product.

Application area

Neural monitoring
Bionic implants
Monitoring implants

Advantages

Safer– Lower power density allows for transmission of power without damaging tissue
Efficient– Improved coil alignment increases the efficiency and safety of power transmission
Less Invasive– Current technologies may require wires to exit/enter the body
Rapid Charging– Lower power density allows for more power to be transmitted at once

Institution

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