DEVELOPMENT OF A BIOINSPIRED POLARIZED SKYLIGHT BASED “NAVIGATION SENSE” FOR HUMANS

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Abstract

We report on the concept development of a MEMS based navigation device to provide an insect-inspired “navigational sense” neurochip built in nanofabrication technology to disabled people. Desert ants navigate far away from their nest by analyzing the polarized skylight pattern. A bioinspired polarized skylight sensor was invented for mobile robot application [1-3]. For implementation in people small size is required. To be placed or implanted in the body, the device should be constructed using the biocompatible material such as Polydimethyloxane (PDMS).

Concept development

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<td>Materials used in electronics (silicon etc.)</td>
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GNSS advantage
• most elaborate operation system for global positioning

GNSS limitation
• low precision of the signal in certain condition such as in urban areas,
• intermittent coverage
• high cost maintenance
• risk to be shut down during times of conflict

Due to these risks there is need for systems that are GPS independent but possess the performance of GNSS

Outlook

• The implementation of the bioinspired polarized light navigation sensor for providing people with a “navigational sense” requires the connection between the devices and the human body.
• This “navigational sense” would be very beneficial to people at risk such as blind people, people bound to a wheelchair, people with Parkinson’s disease and lost people including children.
• The miniaturization of the devices needs to be performed for successful connection to the human body.

References