FIT-4-NMP Networking and Brokerage Event

organized by FIT-4-NMP H2020 project at the 45th International Semiconductor Conference - CAS 2022

Implantable electrodes for neural signals acquiring

The potential market

The global market for active implantable medical devices is estimated to reach USD 26.75 Billion by 2025. The United States controls about 40% of the global market, followed by Europe (25%), Japan (15%) and the rest of the world (20%). The largest market shares in Europe belong to Germany, Italy, France and the United Kingdom.

Medical applications

- stimulation and recording the neural activity in the peripheral nervous system;
- acquisition of neural electrical signals for the control of motor prostheses;
- stimulation of the optic nerve for visual prosthesis;
- electrical stimulation of the nerves, for the restoration of the motor functions;

Our experience

Design and fabrication of implantable electrodes for neural signals acquiring. The novelty of our sensor consists in the unique technological flow which has strong advantages by using cheap, flexible, biocompatible materials, and having significantly lower costs than existing methods.

Our implantable electrodes are biocompatible and were tested in vivo.

Design and fabricate neuroprostheses with sensory feedback and bidirectional communication with the peripheral nervous system from the amputee's stump:

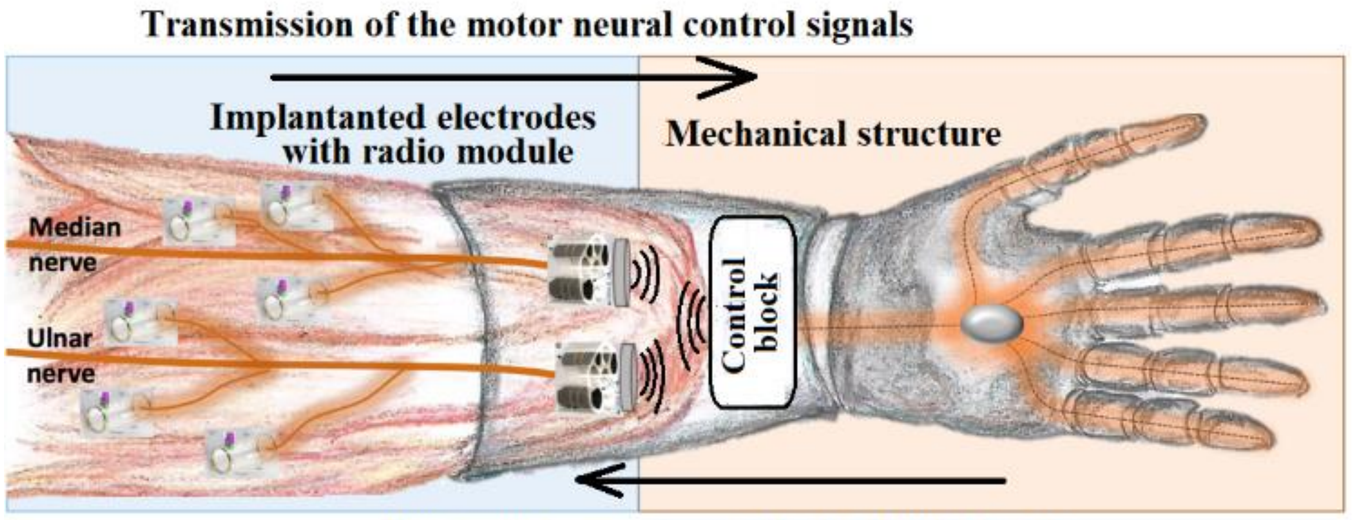
- the movements of the mobile elements of the prosthesis are wirelessly controlled with motor neural signals acquired from the amputee's stump;
- the tactile feedback information from the palm and fingers of the neuroprosthesis are wirelessly transmitted to the sensorial nerve branches in the amputee's stump, giving the amputee tactile sensations.

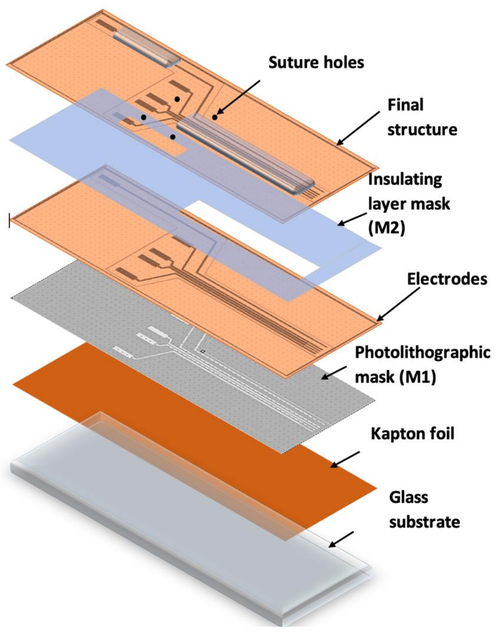
Looking for partners:

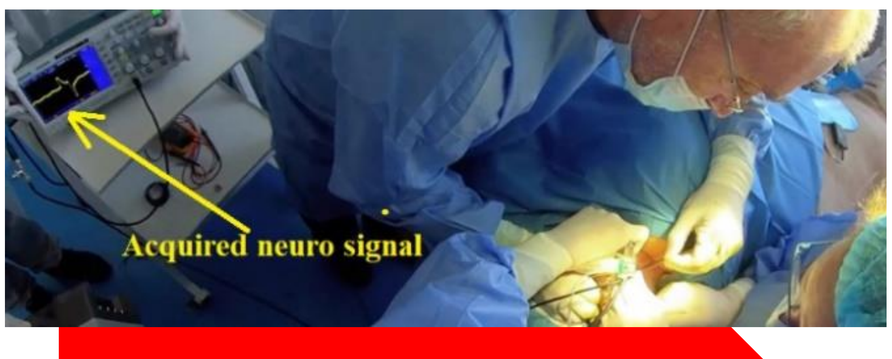
- Fabrication of the implantable wifi module for processing the neural signals.
- Fabrication of the wifi recharge systems for implantable battery

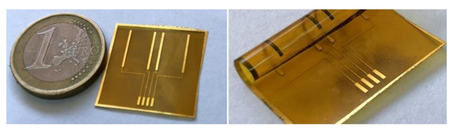
Targeted topics and challenges

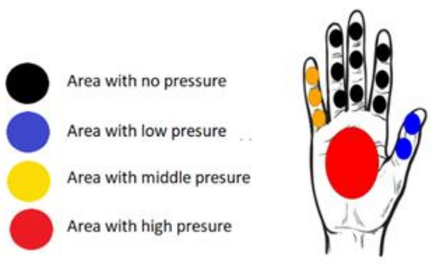
- Health and wellbeing;
- Components, modules and systems integration.

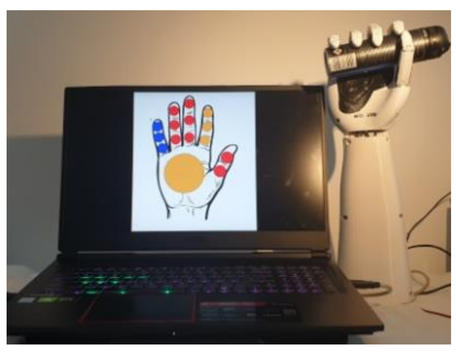












Known partners:

- IMT Bucharest
- Politehnica University of Bucharest
- Academy of Medical Sciences of Romania
- Emergency Clinical Hospital of Bucharest
- University of South-Eastern Norway
- Areus Technology

Needed profiles:

- Implantable neural interface
- Implantable battery with wifi recharge system

Contact details:

Name: Carmen Moldovan, Octavian Ionescu, Eduard Franti
Organisation: IMT Bucharest
Email: carmen.moldovan@imt.ro
octavian.ionescu@imt.ro
eduard.franti@imt.ro

More info:

Additional information

- Blystad L.-C., et all, Bidirectional neuroprosthesis system integration, published in Proceedings of ESTC 2020, pp. 1-7, 15-18 September 2020, USN, Norway, DOI: 10.1109/ESTC48849.2020.9229697, https://ieeexplore.ieee.org/document/9229697

- Kristin Imenes, et all, Implantable Interface for an Arm Neuroprosthesis, in Proceedings of the 23rd European Microelectronics and Packaginng Conference & Exhibition, EMPC 2021, September 13-16 2021, pp.127 – 132

- Carmen Moldovan, et all, Remote Sensing System for Motor Nerve Impulse, Sensors 2022, 22, 2823

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