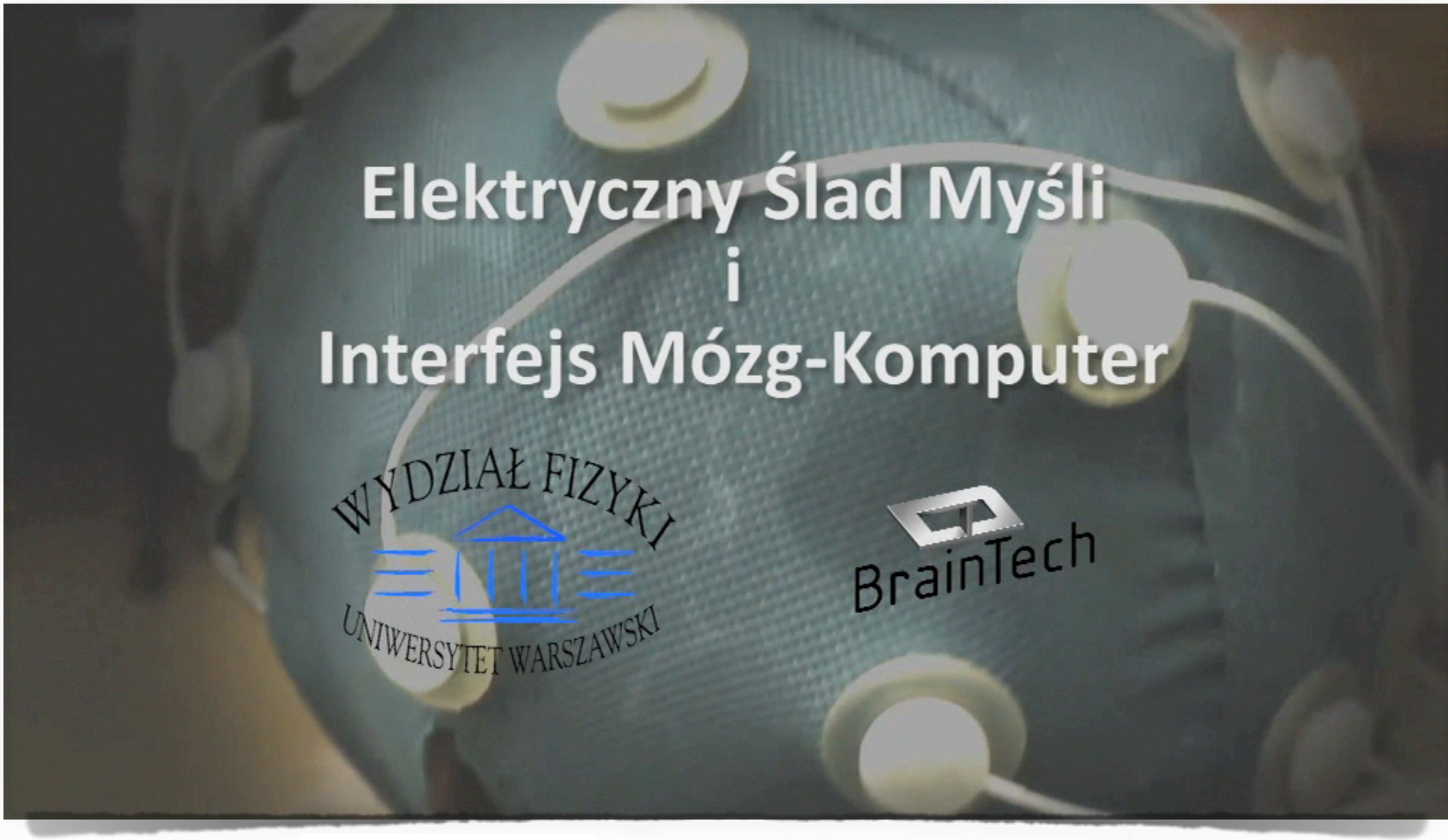
Recent advances in brain-computer interfaces from BrainTech.pl

Anna Chabuda [1][2]; Marian Dovgialo [1][2]; Piotr Różański [1][3]; Michał Wieteska [1][4]; Maciej Pawlisz [1]; Anna Duszyk [2][5]; Jarosław Żygierewicz [2]; Tomasz Rudkiewicz [6]; Piotr Durka [1][2]

[1] BrainTech Ltd, ul. Jeziorna 23, 02-911 Warsaw, Poland http://braintech.pl; [2] University of Warsaw, Faculty of Physics, Warsaw, Poland; [3] University of Warsaw, College of Inter-Faculty Individual Studies in Mathematics and Natural Sciences (MISMaP), Warsaw, Poland; [4] Warsaw University of Technology, Warsaw, Poland; [5] University of Social Sciences and Humanities, Warsaw, Poland; [6] NC.ART, Studio projektowe wzornictwa przemysłowego, Raszyn, Poland

XI KONFERENCJA
ELEKTROFIZJOLOGICZNA
WARSZAWA, 25-26 V 2018



Fundusze Europejskie Inteligentny Rozwój
Unia Europejska Europejski Fundusz Rozwoju Regionalnego

A decade of BCI research in Poland (and few decades worldwide)

The first public presentation of a working BCI in Poland:
University of Warsaw, Faculty of Physics,
Letnia Szkoła Fizyki, June 2008.

NEURALINK

Neuralink is developing ultra high bandwidth brain-machine interfaces to connect humans and computers.

Elon Musk Launches Neuralink to Connect Brains With Computers

Startup from CEO of Tesla and SpaceX aims to implant tiny electrodes in human brains

By *Rolfe Winkler*

March 27, 2017 3:24 p.m. ET

The Neuralink team:

Paul Merolla, who spent the last seven years as the lead chip designer at IBM on their SyNAPSE program, where he led the development of the TrueNorth chip—one of the largest CMOS devices ever designed by transistor count nbd. Paul told me his field was called neuromorphic, where the goal is to design transistor circuits based on principles of brain architecture.

Vanessa Tolosa, Neuralink's microfabrication expert and one of the world's foremost researchers on biocompatible materials. Vanessa's work involves designing biocompatible materials based on principles from the integrated circuits industry.

Max Hodak, who worked on the development of some groundbreaking BMI technology at Miguel Nicolelis's lab at Duke while also commuting across the country twice a week in college to run Transcriptic, the "robotic cloud laboratory for the life sciences" he founded.
DJ Seo, who while at UC Berkeley in his mid-20s designed a cutting-edge new BMI concept called neural dust—tiny ultrasound sensors that could provide a new way to record brain activity.

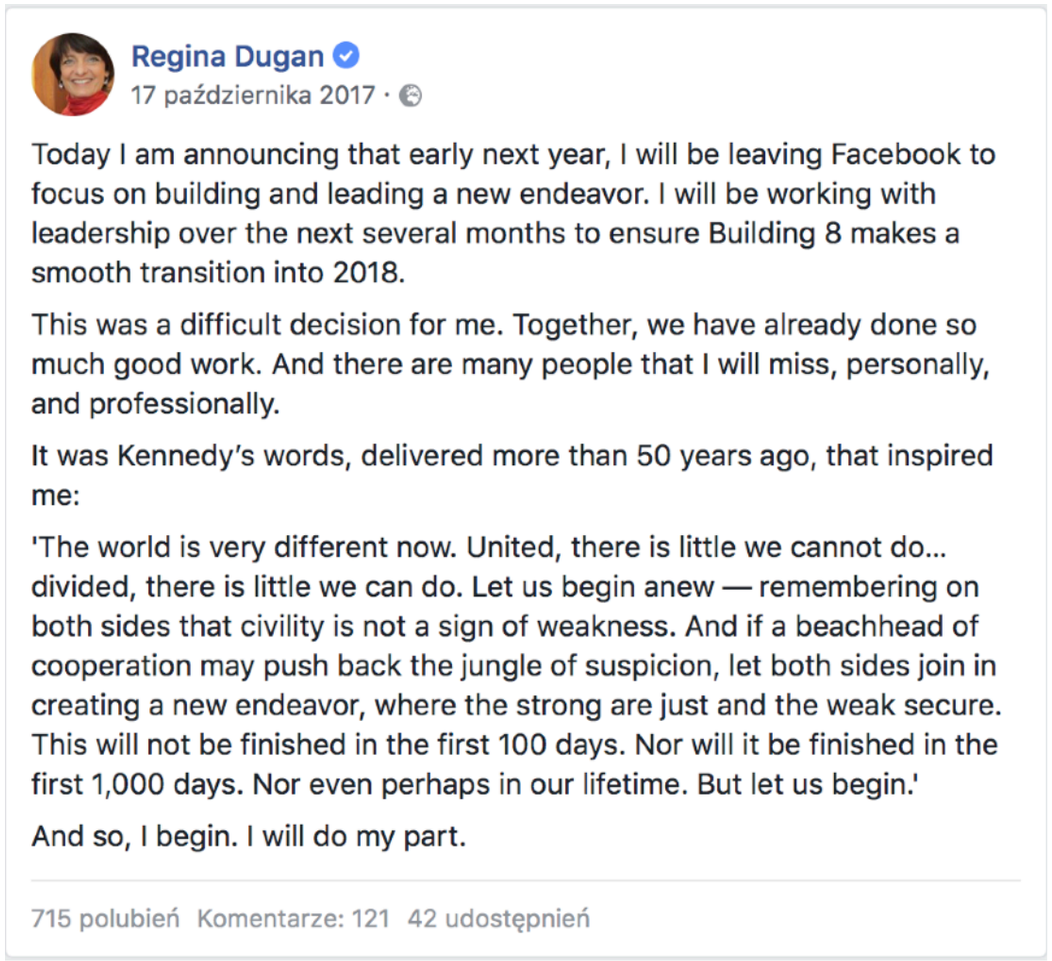
Ben Rapoport, Neuralink's surgery expert, and a top neurosurgeon himself. But he also has a PhD in Electrical Engineering from MIT, allowing him to see his work as a neurosurgeon "through the lens of implantable devices."

Tim Hanson, whom a colleague described as "one of the best all-around engineers on the planet" and who self-taught himself enough about materials science and microfabrication methods to develop some of the core technology that'll be used at Neuralink.

Facebook F8 - Developer Conference April 2018

At F8 2017, Facebook revealed it has a team of 60 engineers working on building a brain-computer interface that will let you type with just your mind without invasive implants. The team plans to use optical imaging to scan your brain a hundred times per second to detect you speaking silently in your head, and translate it into text.

Regina Dugan, the head of Facebook's R&D division Building 8, explained to conference attendees that **the goal is to eventually allow people to type at 100 words per minute,** 5X faster than typing on a phone, with just your mind.



Regina Dugan
17 października 2017 ·

Today I am announcing that early next year, I will be leaving Facebook to focus on building and leading a new endeavor. I will be working with leadership over the next several months to ensure Building 8 makes a smooth transition into 2018.

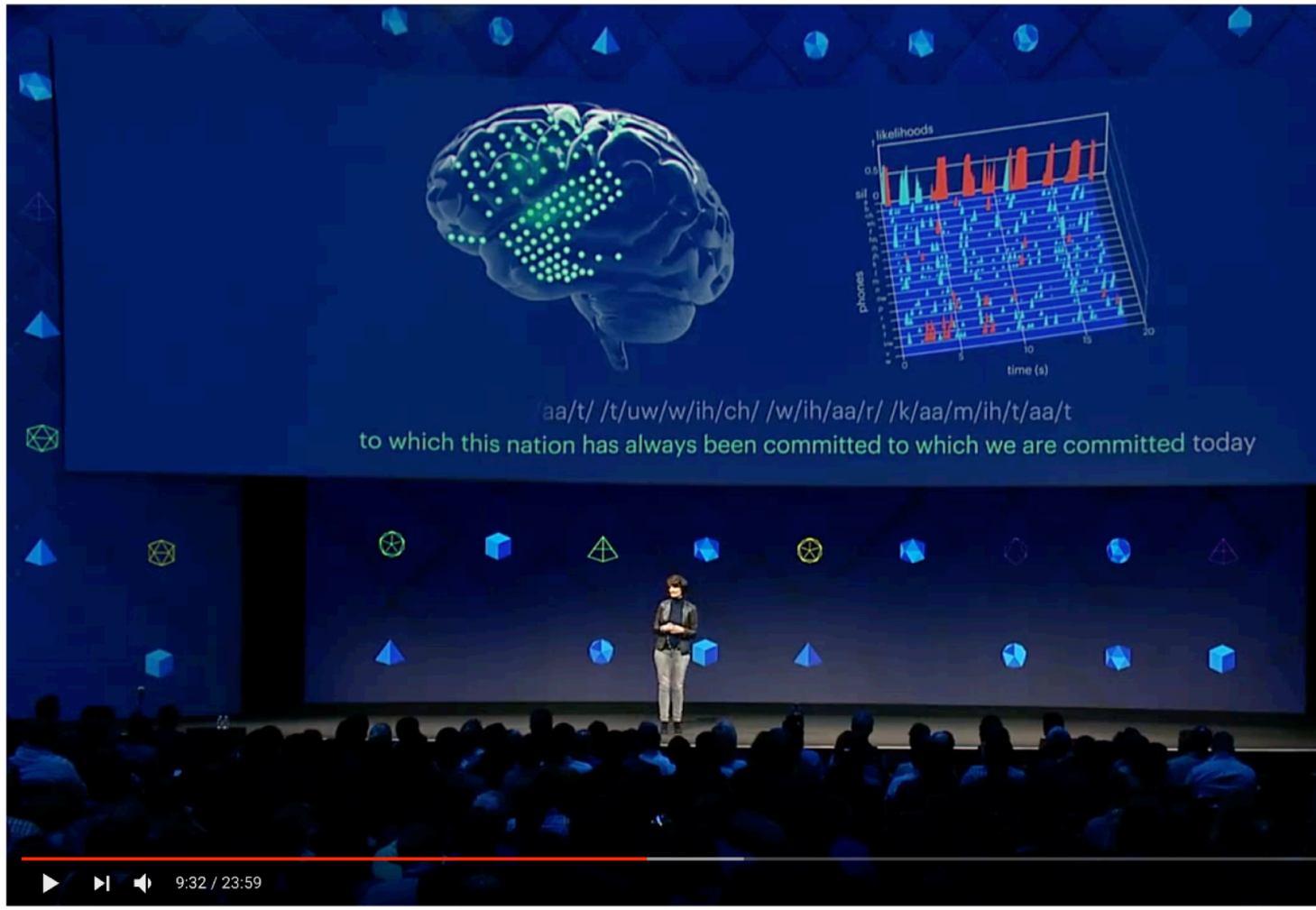
This was a difficult decision for me. Together, we have already done so much good work. And there are many people that I will miss, personally, and professionally.

It was Kennedy's words, delivered more than 50 years ago, that inspired me:

'The world is very different now. United, there is little we cannot do... divided, there is little we can do. Let us begin anew — remembering on both sides that civility is not a sign of weakness. And if a beachhead of cooperation may push back the jungle of suspicion, let both sides join in creating a new endeavor, where the strong are just and the weak secure. This will not be finished in the first 100 days. Nor will it be finished in the first 1,000 days. Nor even perhaps in our lifetime. But let us begin.'

And so, I begin. I will do my part.

715 polubień Komentarze: 121 42 udostępnień



F8 - Building 8 (Mind Reading Technology) - Regina Dugan

2,389 views 20

S **svyaene**
Published on Apr 24, 2017

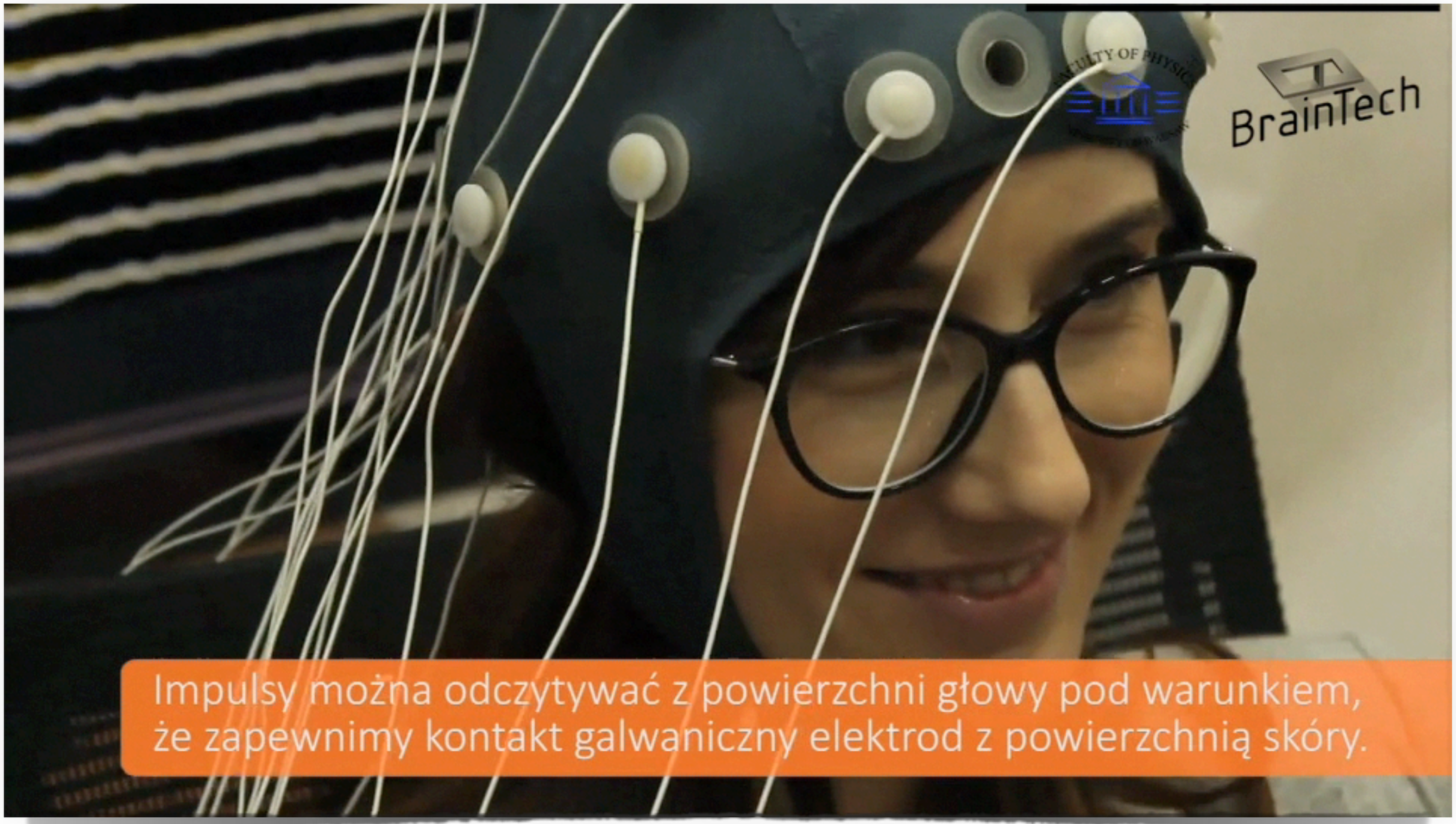
Nothing new about FB and Neuralink BCI for over a year.

high role of specific know-how, experience and scholarship

lack of noninvasive, unobtrusive sensors

hard to spot artifacts and lack of online monitoring tools

fastest modality (SSVEP) can induce photo-epileptic attacks



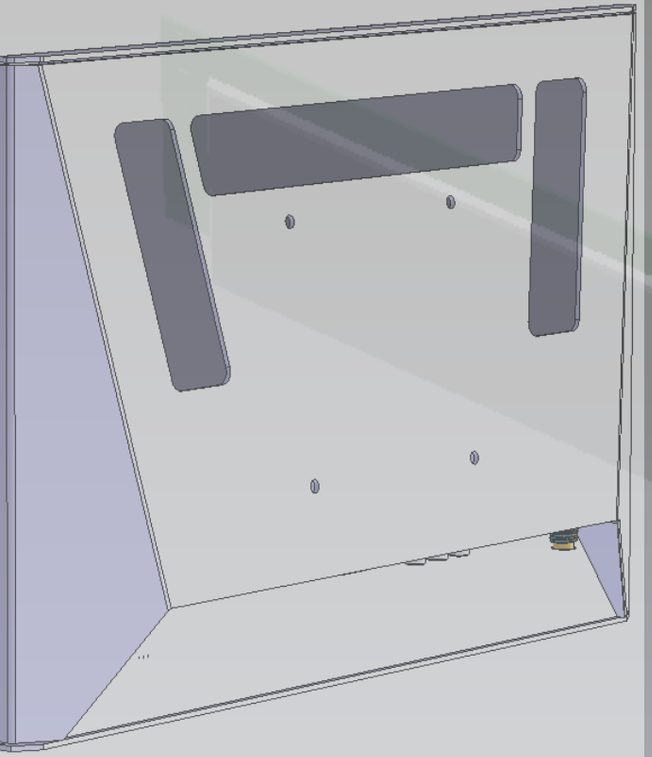
our solutions

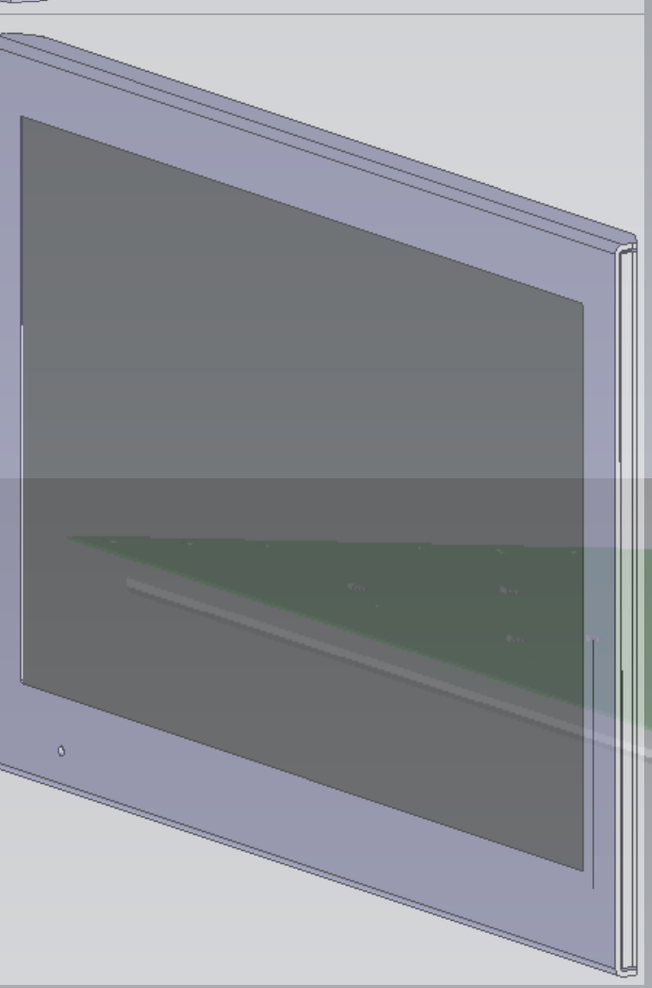
- close link between industry and Academia
- potential of the world's first full Neuroinformatics curriculum at the University of Warsaw
- less sensors, better hardware
- stable software with task-specific tools like BCI control panel
- SSVEP in high frequencies (BCI Appliance)

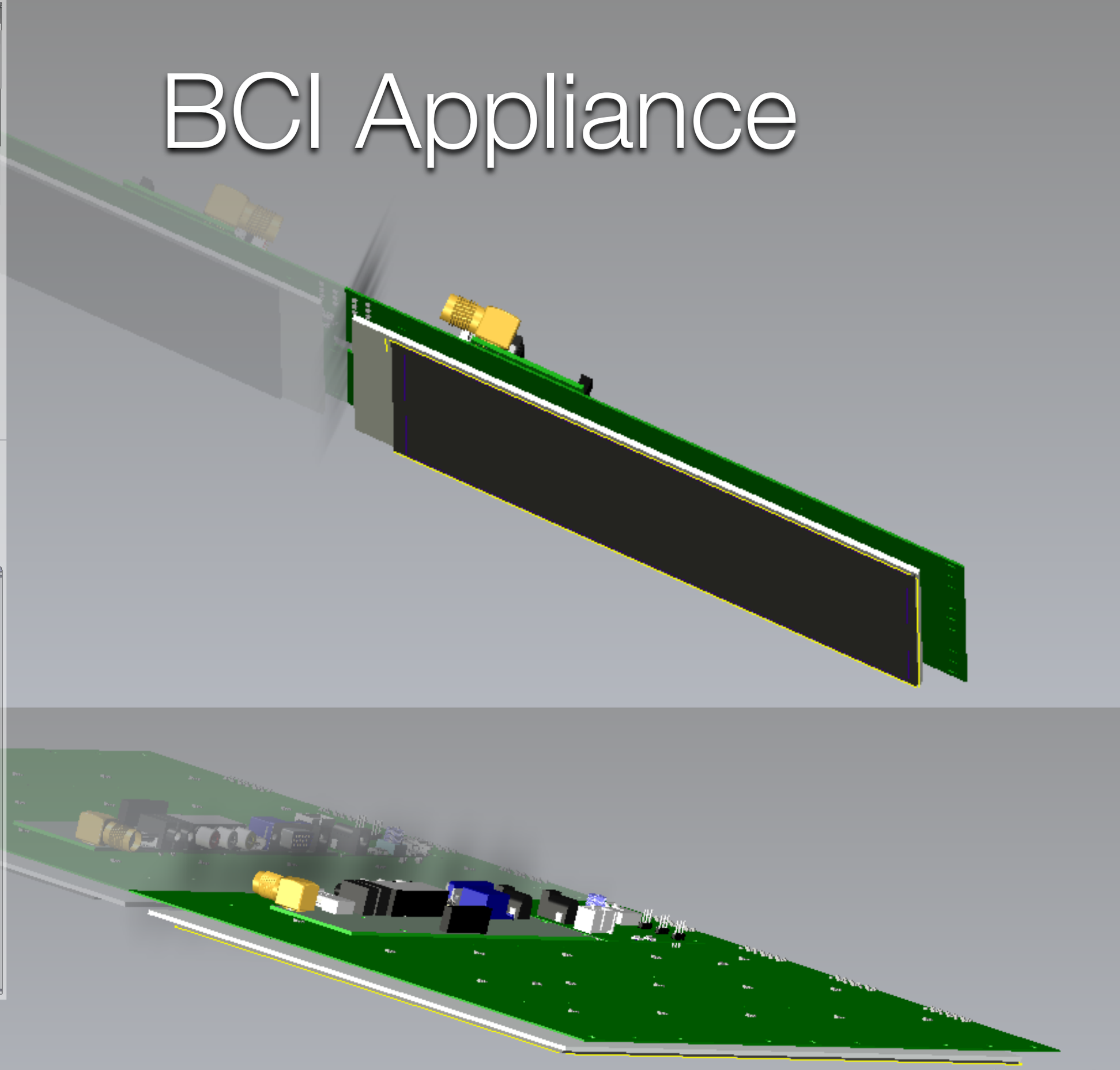
BCI Appliance

Nowatorskie w skali światowej Urządzenie BCI okazało się najszybszym interfejsem mózg-komputer na CeBIT 2012.

BCI Appliance







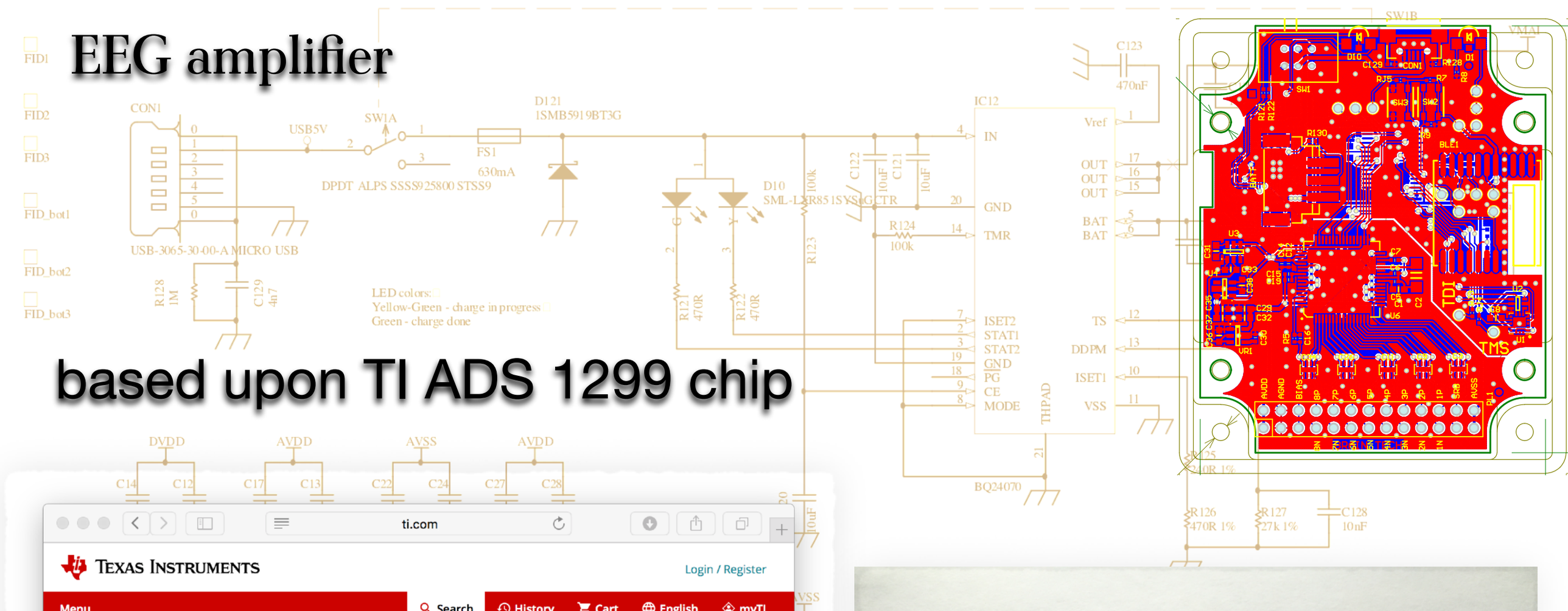
BCI Appliance

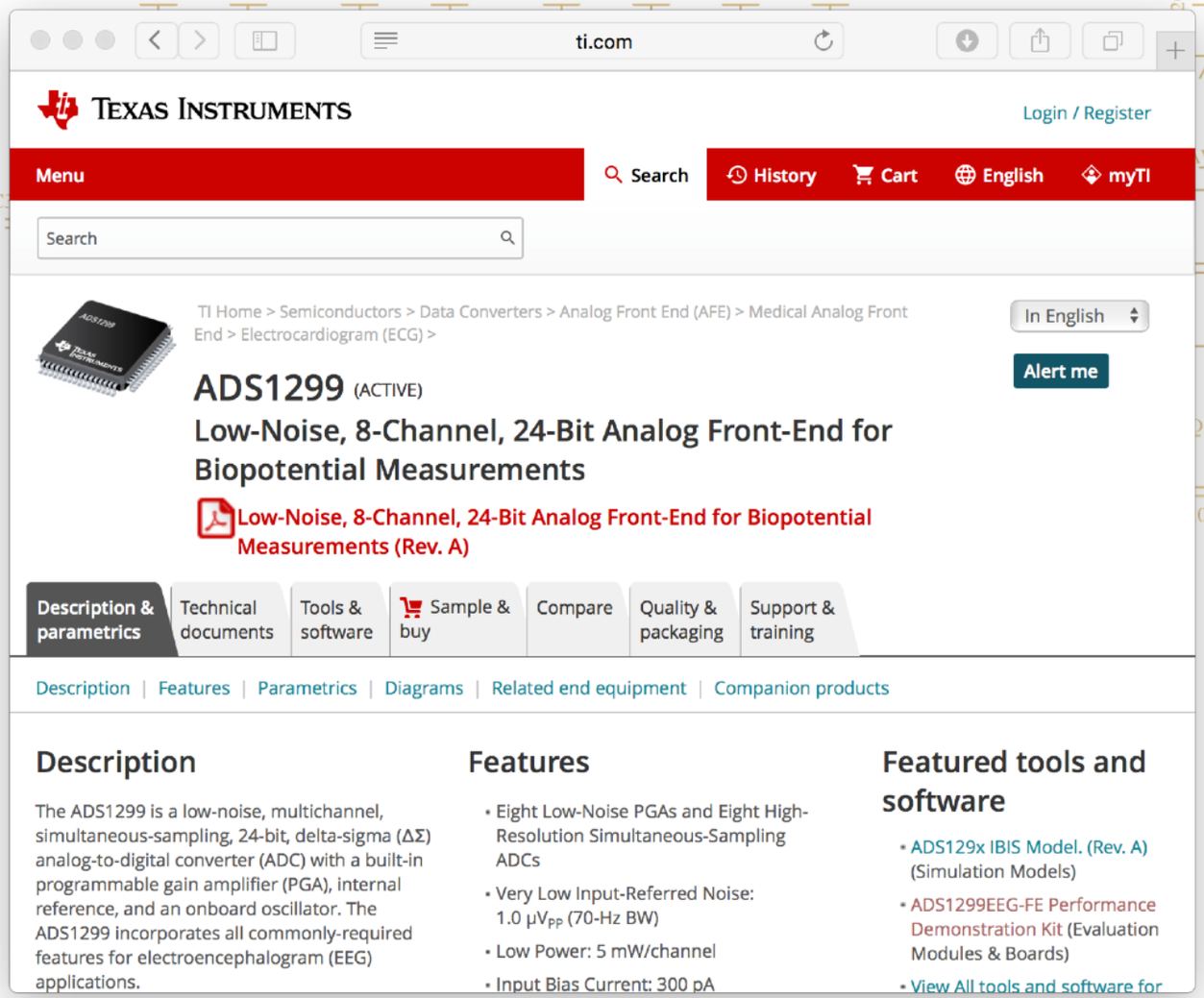
Thursday

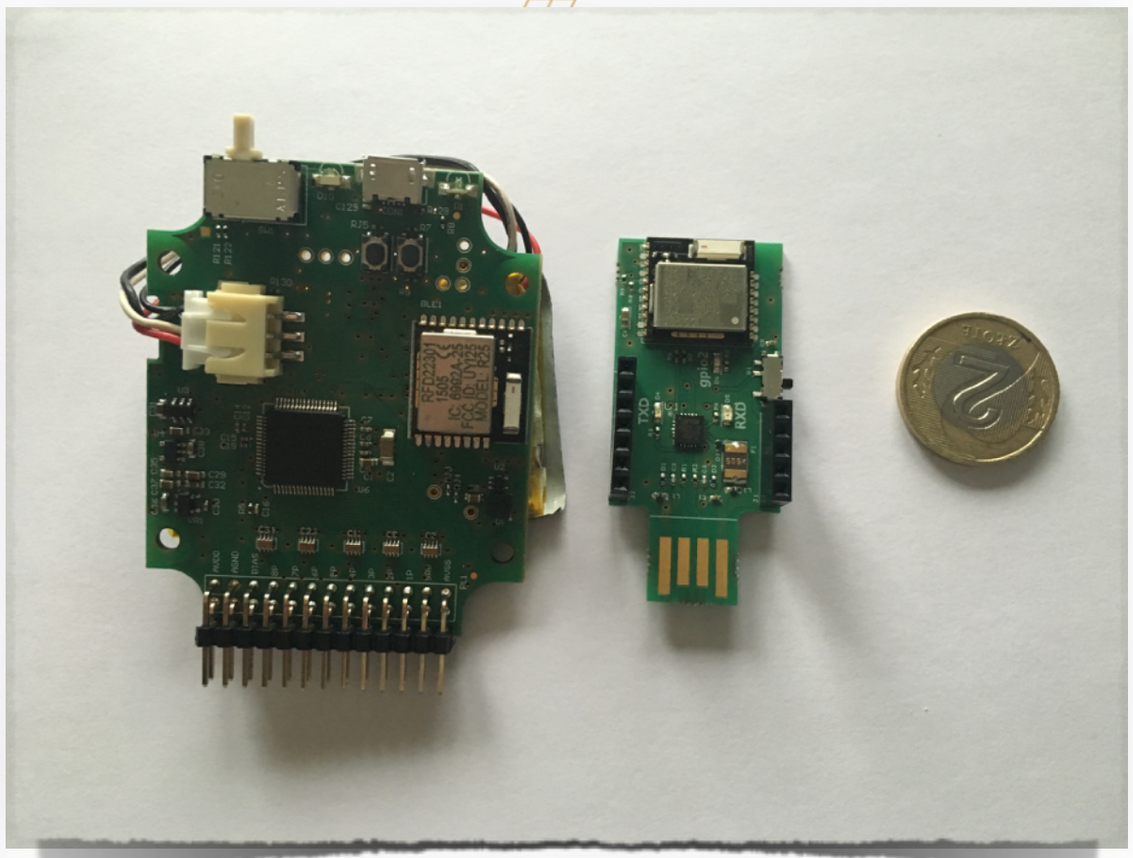
Today :)

EEG amplifier

based upon TI ADS 1299 chip

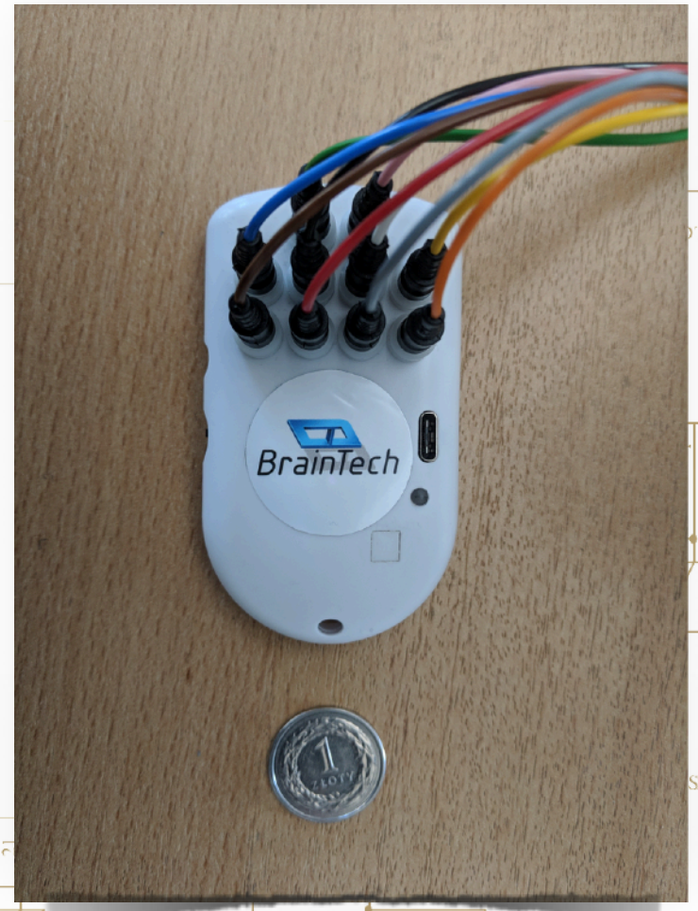




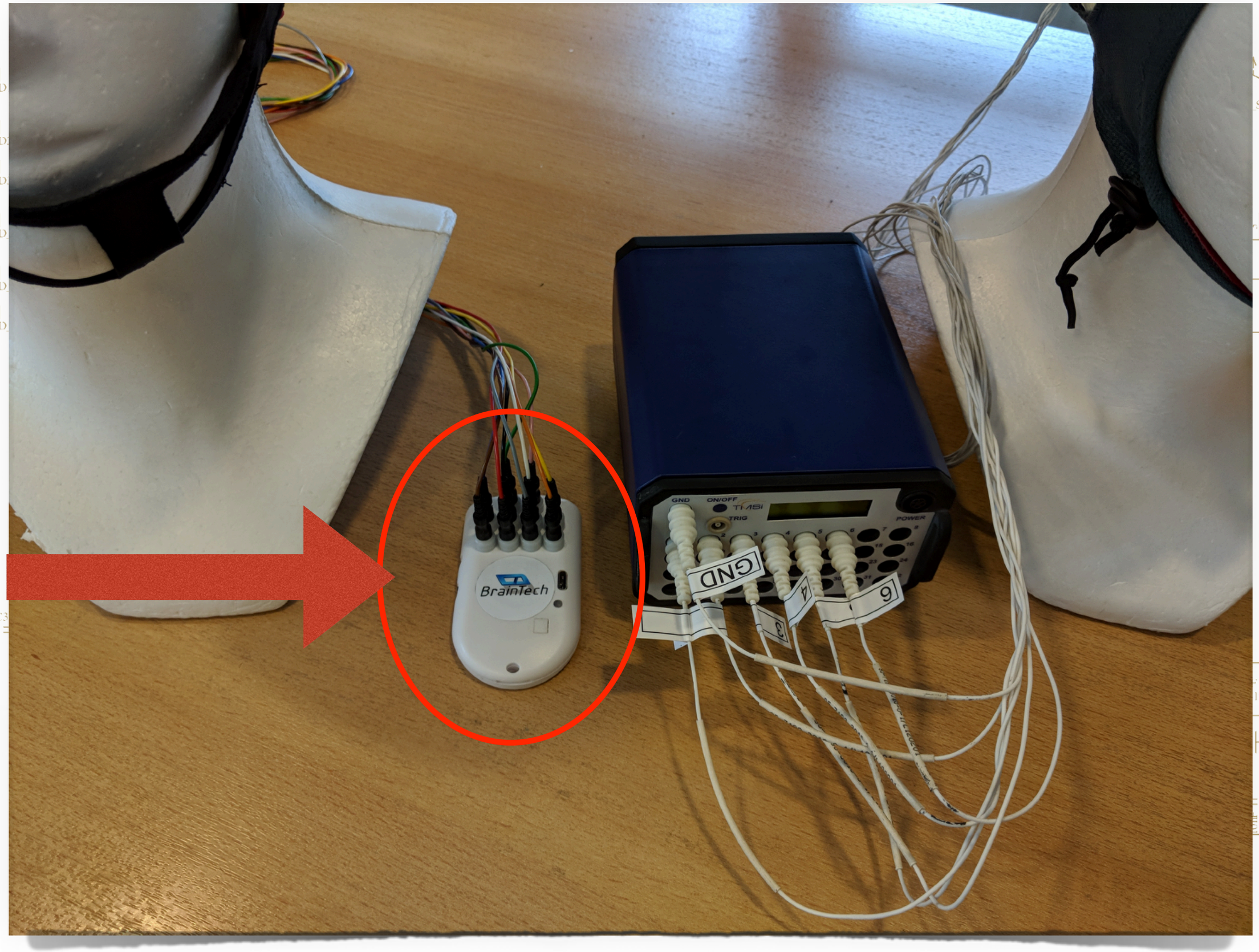


EEG amplifier

1. online impedance measurement
2. resolution 24 bits 44 nV / bit
3. range +/- 373.5mV
4. impedance 1GΩ
5. sampling frequency 500 Hz
6. internal noise 1.16 µV p2p; 0.165 µV RMS (20.6 b)
7. input noise on the connector 0.2 µV; 1.43 µV Ωp2p (20.3 b)
8. power consumption 24 mA (15 hours on a single charge)
9. USB-C charging port

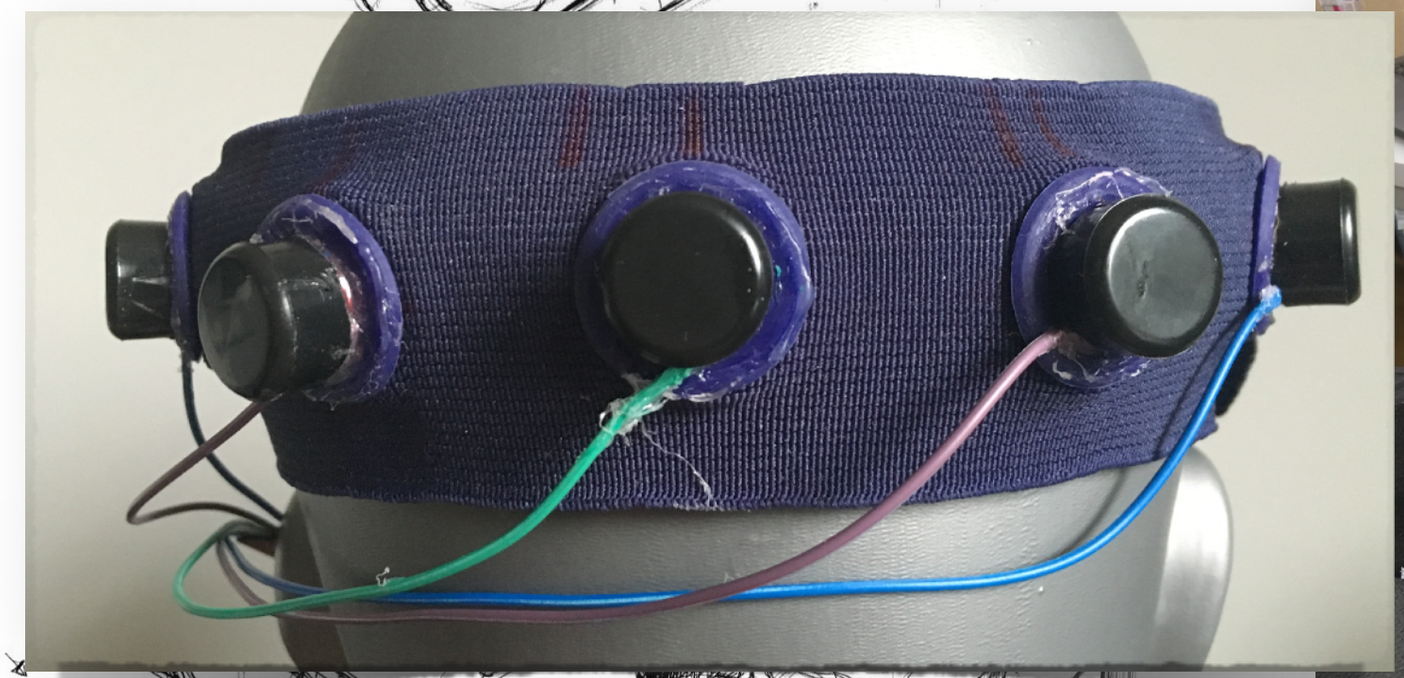


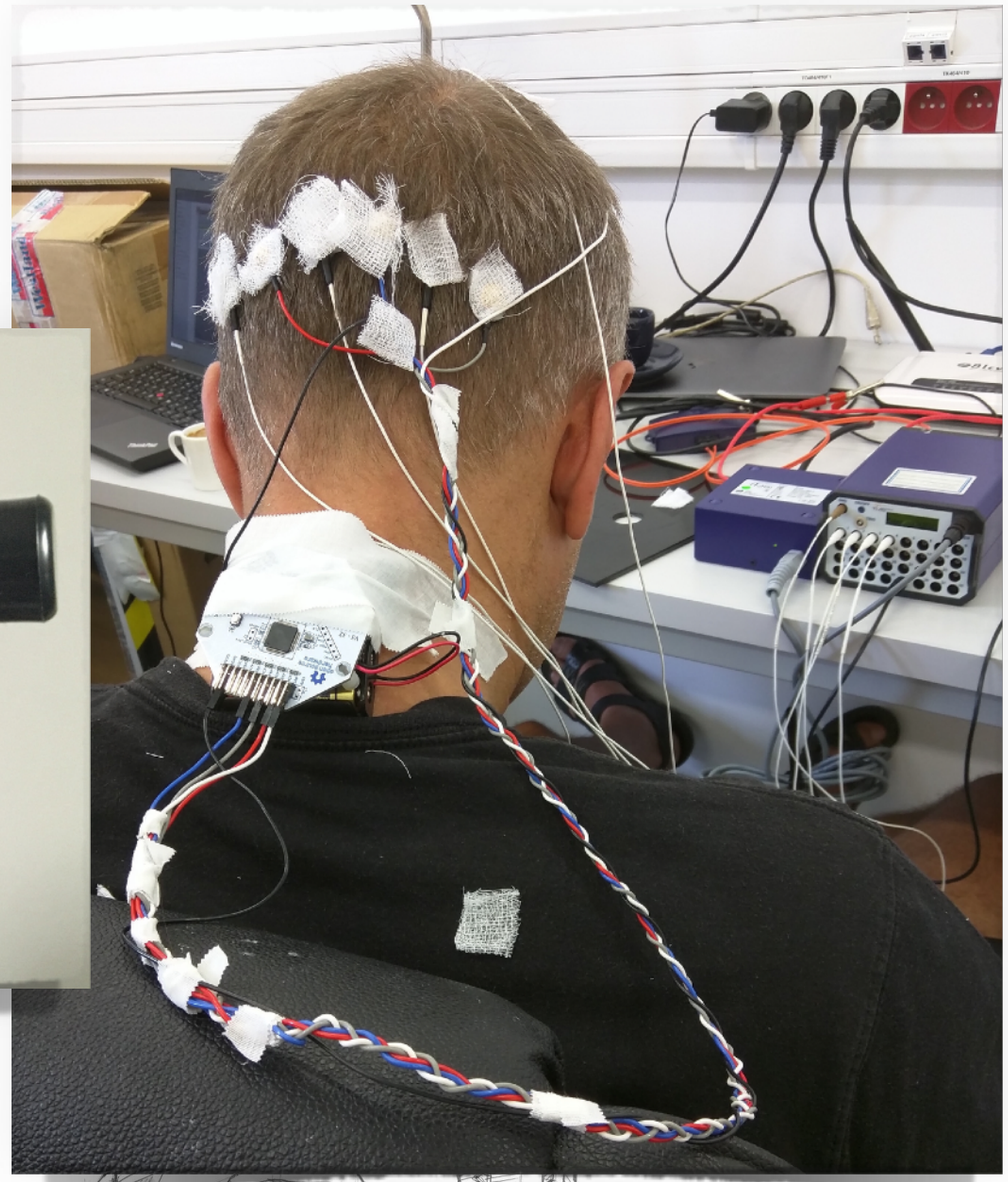
EEG amplifier

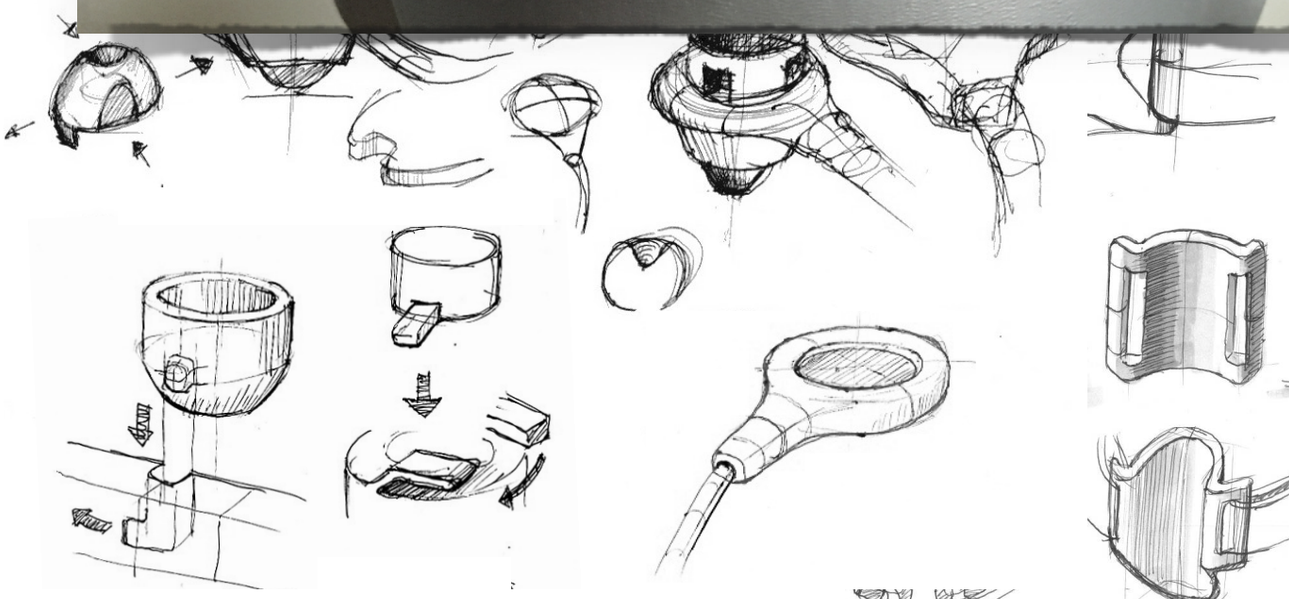


headset: first prototypes :)

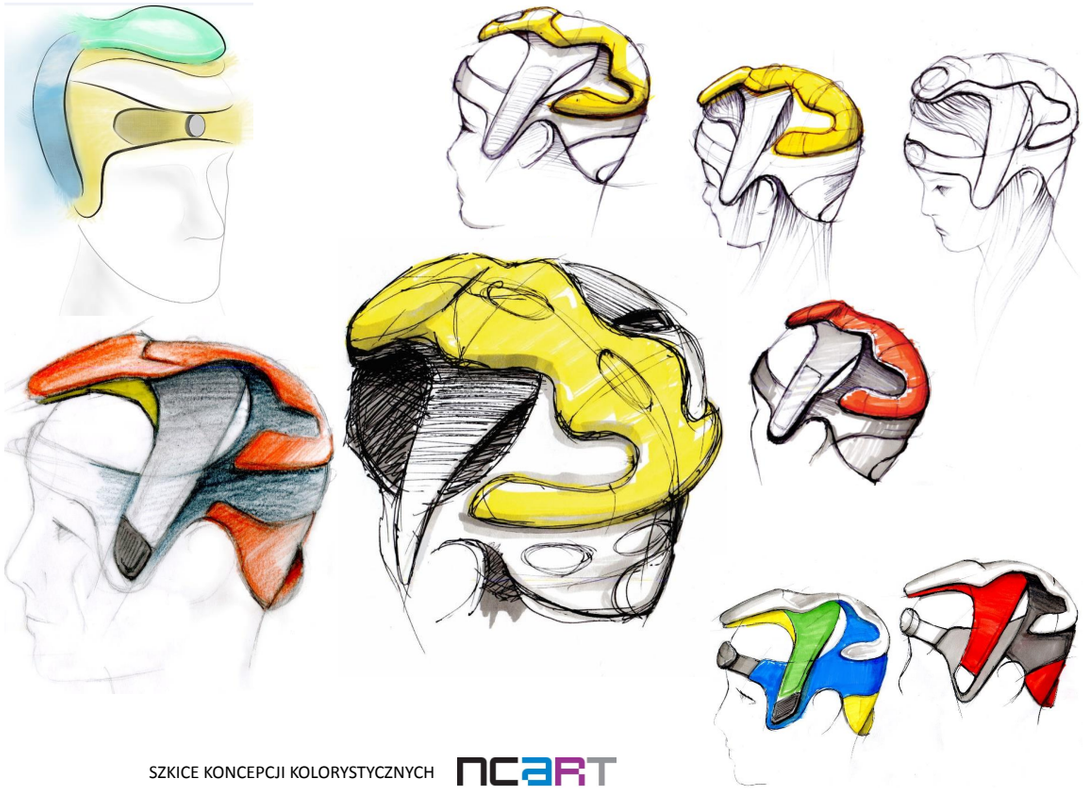
KONCEPCJE - nowe gniazda elektrod







headset



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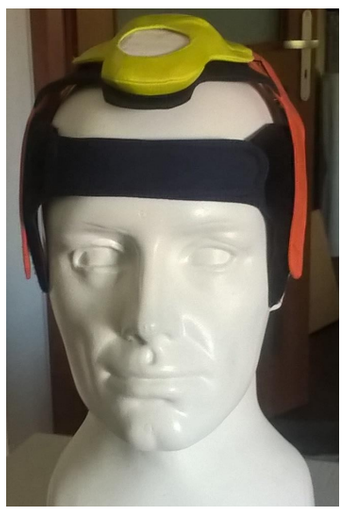

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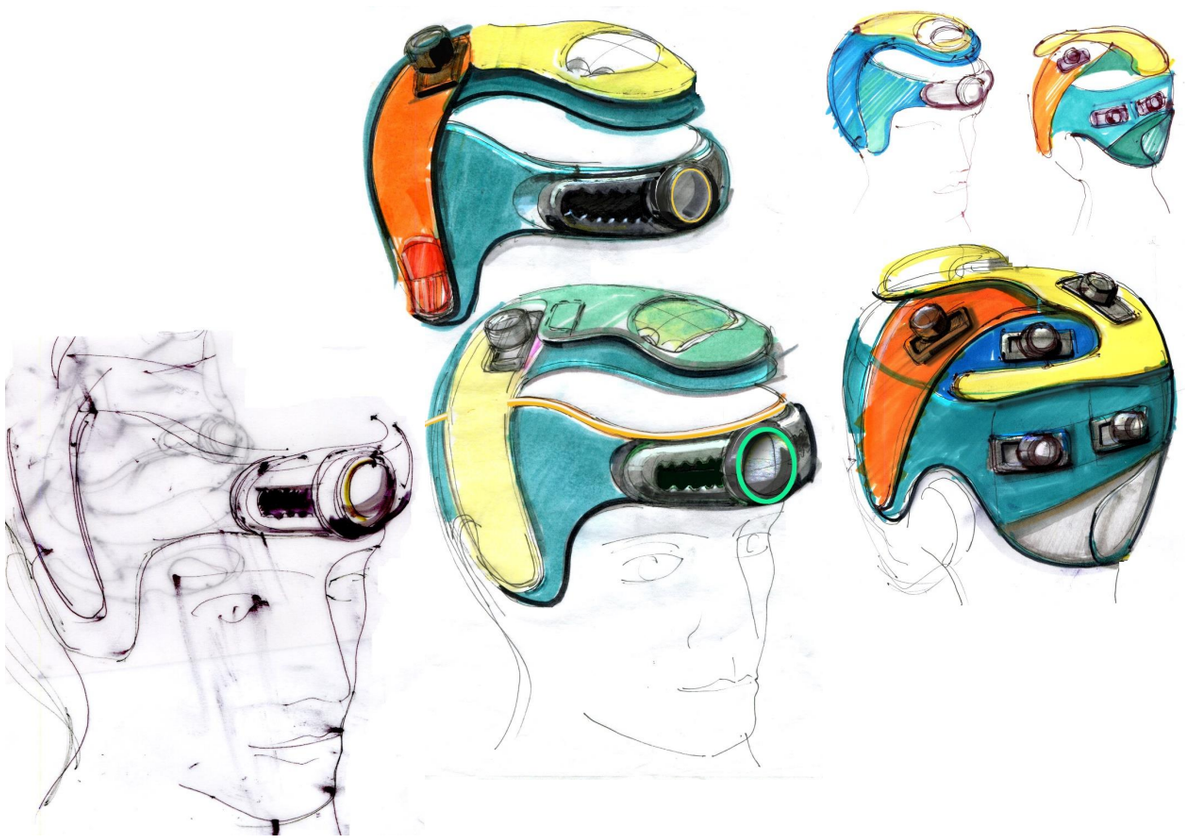

KONCEPCJA SPECJALNEGO MOCOWANIA ncART

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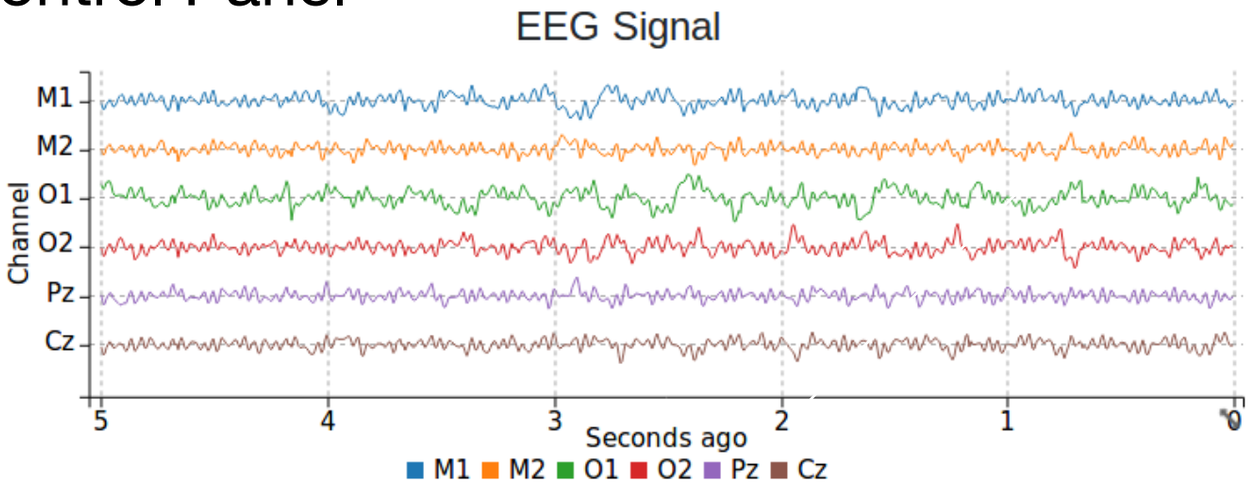

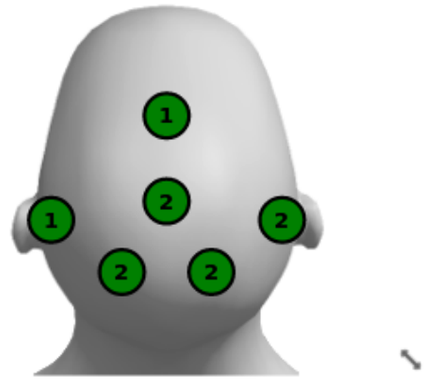

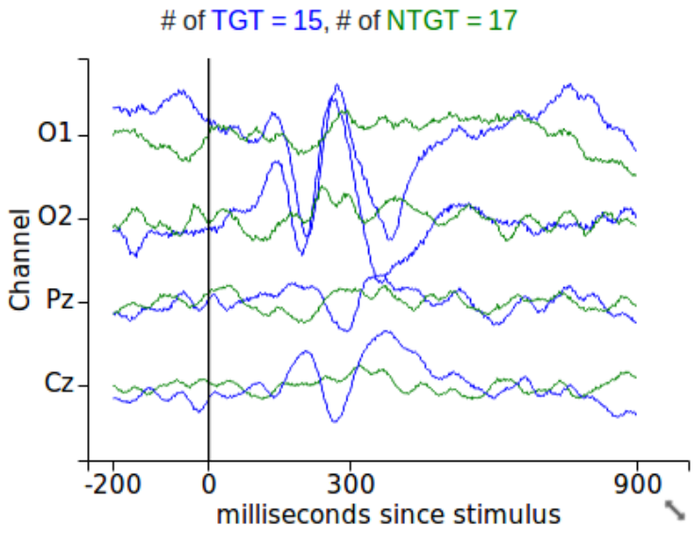

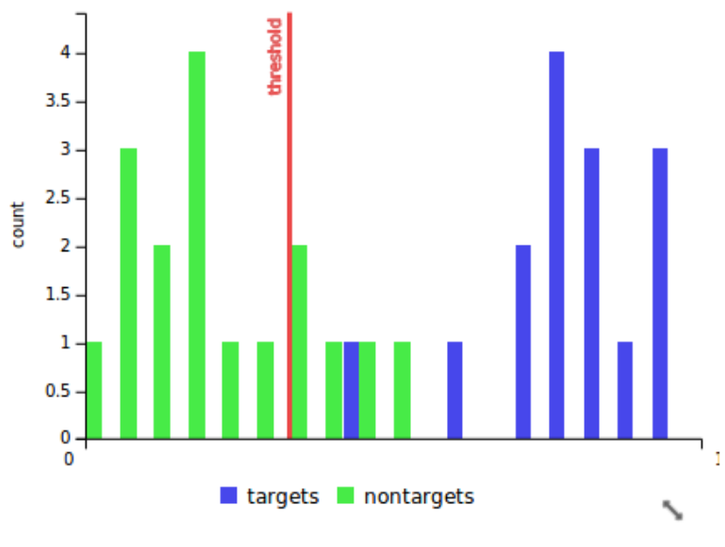

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