VIBraTE

Докторантска среща – ИИКТ

5 ФЕВРУАРИ 2026

Funded by
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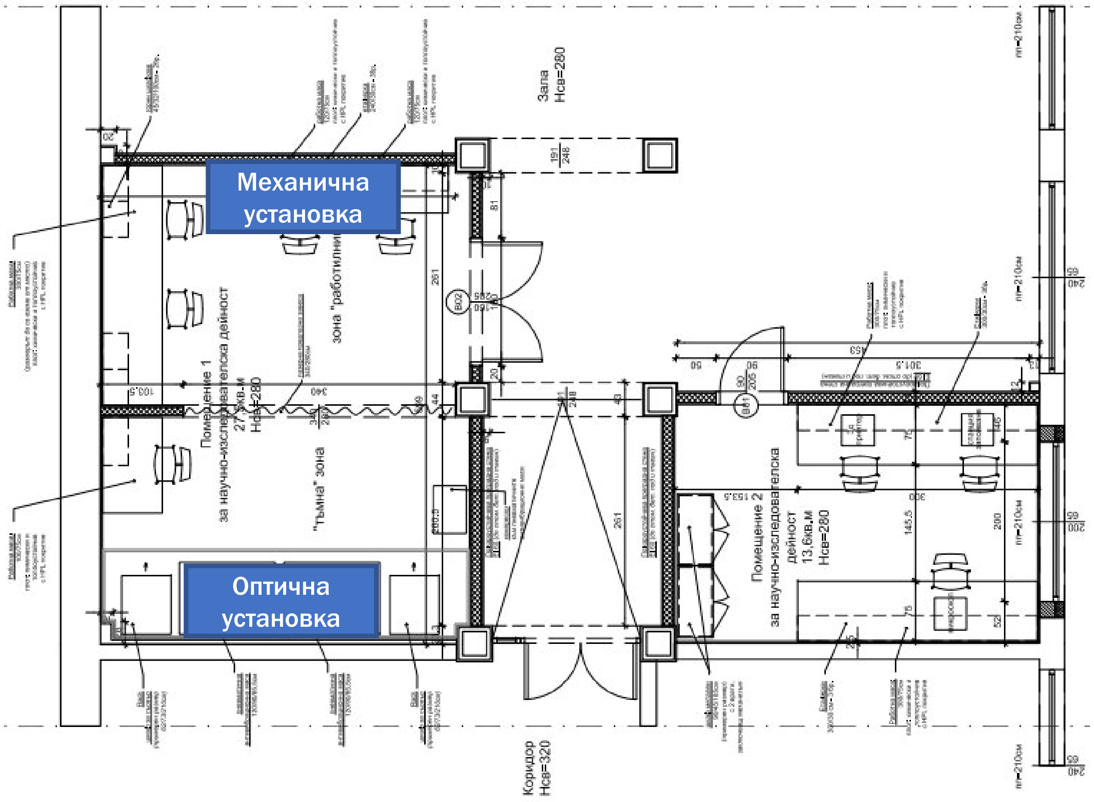


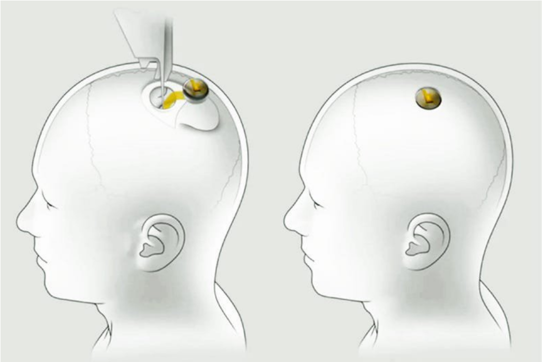
- Лаборатория по Невротехнолгии
- бл 25А

Neurotechnology Lab layout

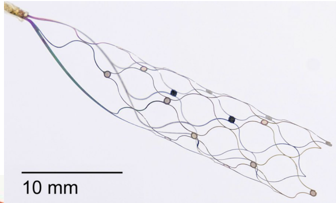
Funded by the European Union

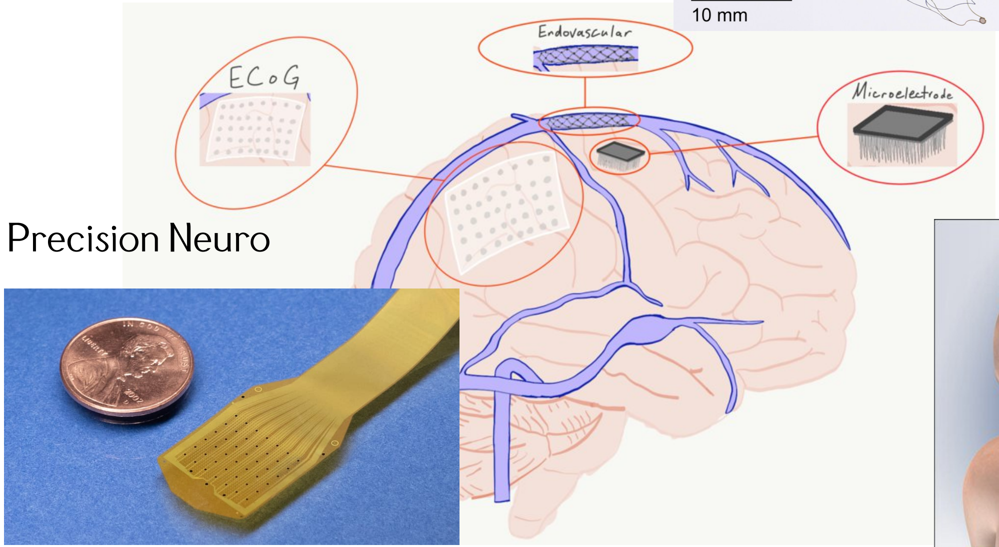
ИНВАЗИВНИ И ЧАСТИЧНО-ИНВАЗИВНИ ТЕХНОЛОГИИ

Neuralink

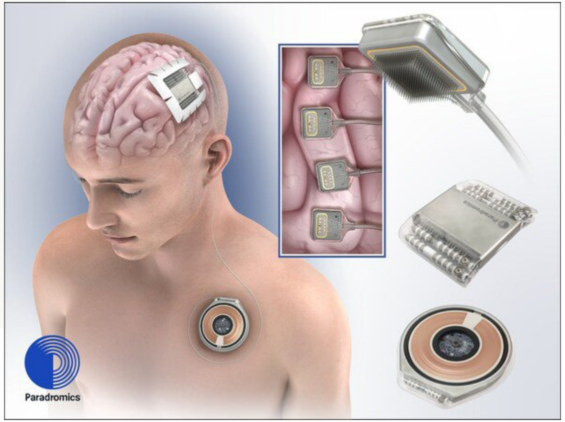


Synchron





Precision Neuro

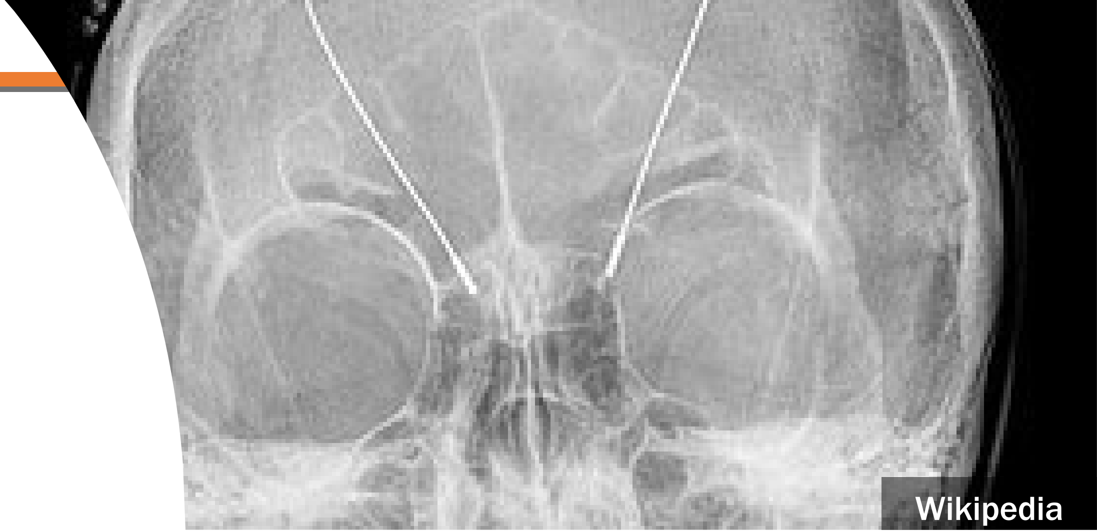


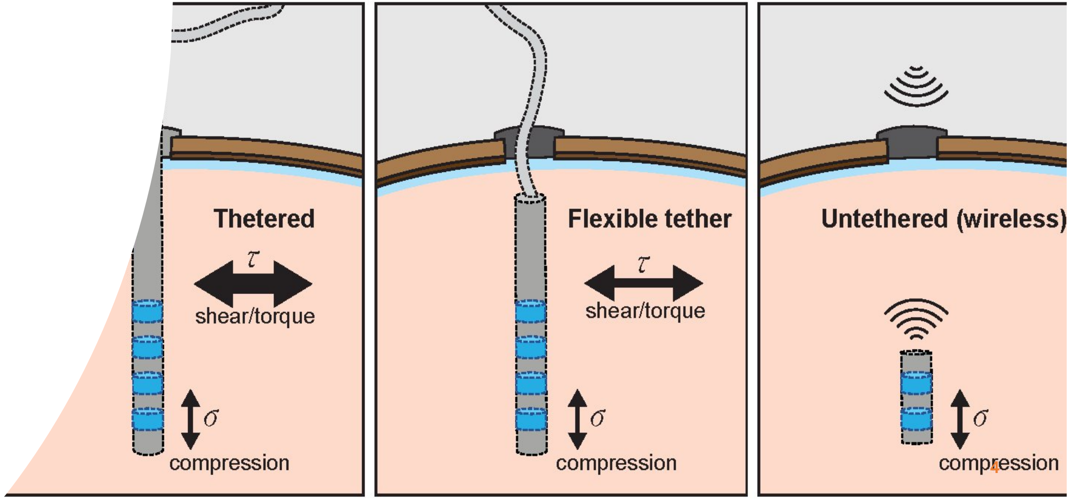
Paradromics

ДВИЖЕНИЯ НА МОЗЪКА

Вибрации при

- Движения на главата
- Дишане
- Сърдечна дейност





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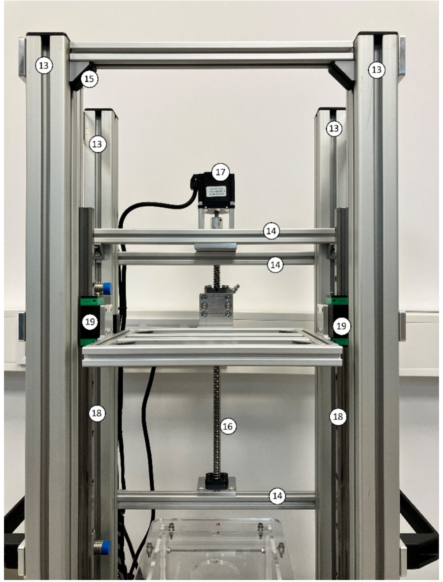
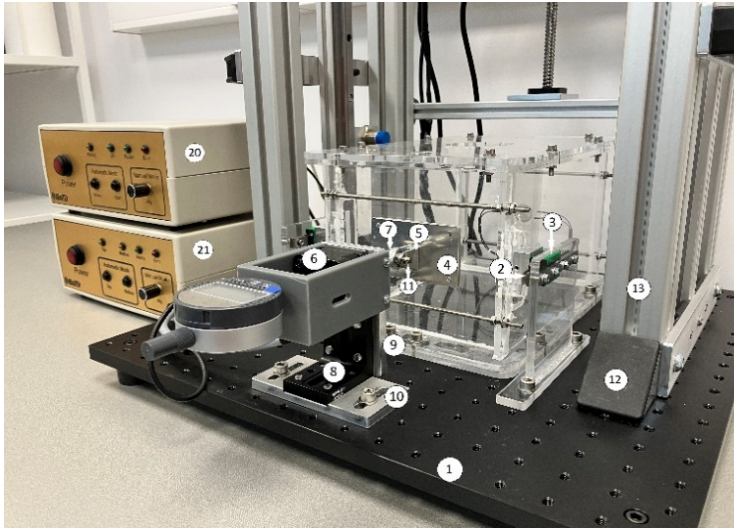
Лѣтно училище Созопол – Май 2025

Научна програма

- Axis 1: Viscoelastic coupling
- Axis 2: Optimization of the interface geometry
- Axis 3: Diffusion phenomena in the brain tissue
- Axis 4: Effects of viscoelastic deformations on modelled brain activity





IEEE Conference paper

2025 6th International Conference on Communications, Information, Electronic and Energy Systems (CIEES)
26 – 28 November, 2025, Ruse, Bulgaria

Electromechanical setup for measuring viscoelastic interactions of a brain phantom

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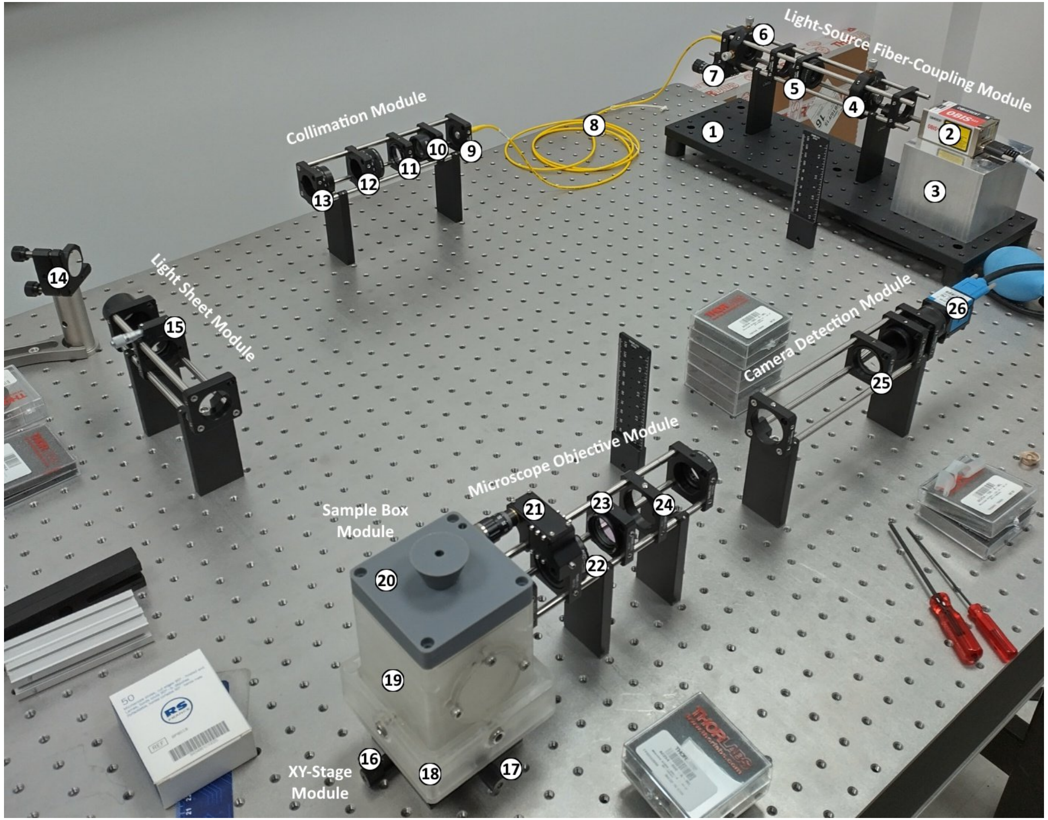
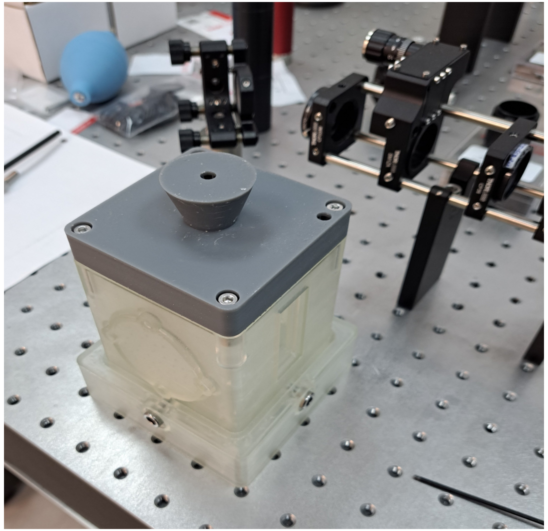
Optical Setup



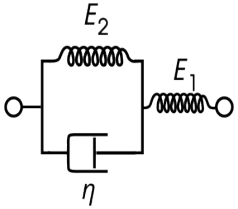
Sample Unit → shows actuation membrane mechanism:

Axis 1: Viscoelastic coupling

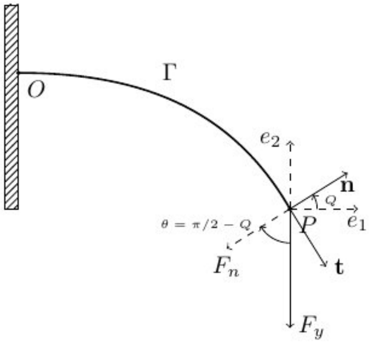
- Brain phantoms
- FEM simulations
- Euler-Bernoulli beam theory – 1 article



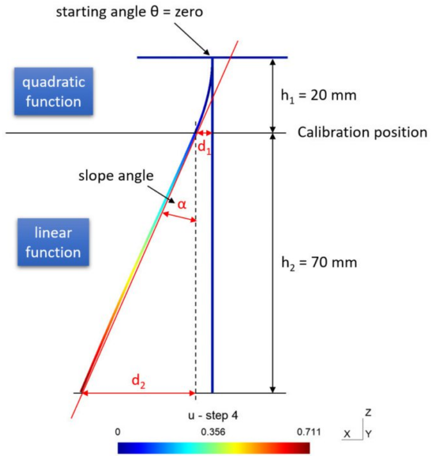
реологичен модел



Displacement sensor = Euler-Bernoulli elastic beam



Incompressible elastic medium



Displacement vector as a function of the curve length

$$V(s) = -e_2 \frac{2(\mathrm{dn}(qs|m) - 1)}{qm} + e_1 \frac{2\,\epsilon(qs|m) - (2-m)qs}{qm}$$

Article | 9 August 2025

Elastic Curves and Euler–Bernoulli Constrained Beams from the Perspective of Geometric Algebra

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Mathematics **2025**, *13*(16), 2555; https://doi.org/10.3390/math13162555

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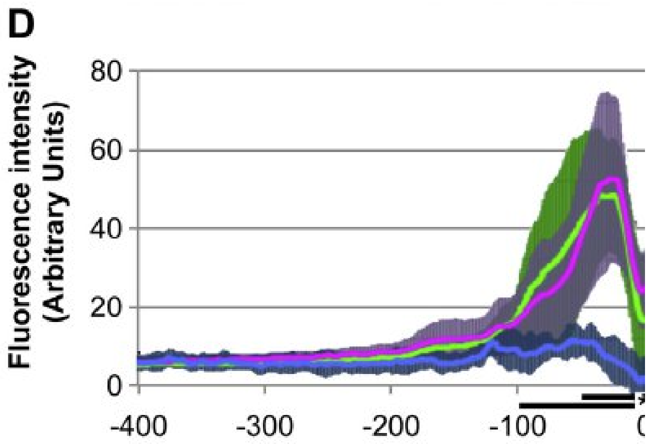
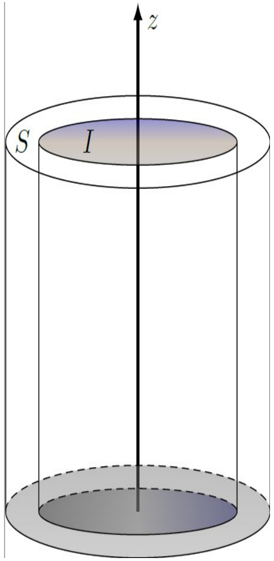
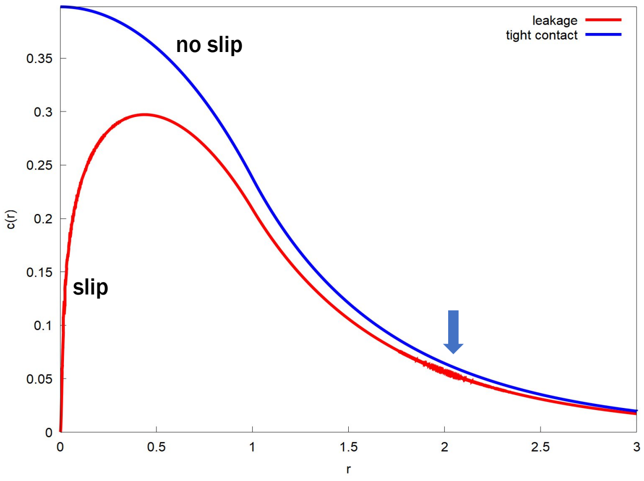
Diffusion of substance around an electrode



J.L. Skousen et al. / Biomaterials 36 (2015) 33e43



Flux condition as a proxy to the electrode friction?



Numerical integration (naïve) – some issues with oscillations -> alternative approach (in progress)

Proposition 4.

$$K_\alpha(r) = \int_0^\infty \frac{s^{2\alpha} E_{2\alpha,2\alpha}(-s^{2\alpha})}{\sqrt{(r^2+s^2)^3}}\, ds$$

Integral representation of the M-L function

$$E_{a,b}(z) = \int_0^{+\infty} e^{-t} W\left(a, b \middle|\, zt\right) dt$$

unesco

SHS/BIO/AHEG-Neuro/2024/2

FIRST DRAFT OF THE RECOMMENDATION ON THE ETHICS OF NEUROTECHNOLOGY