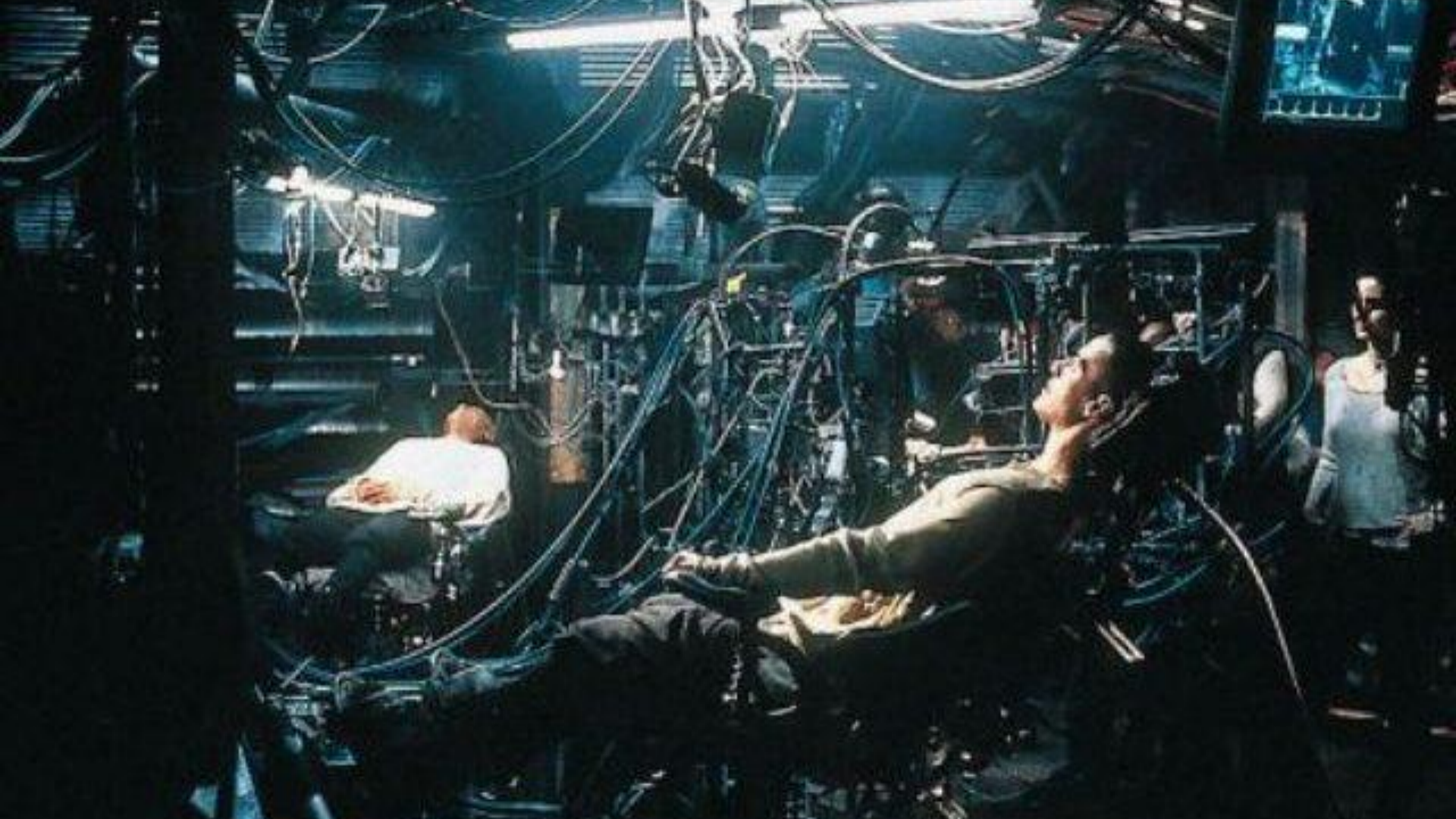
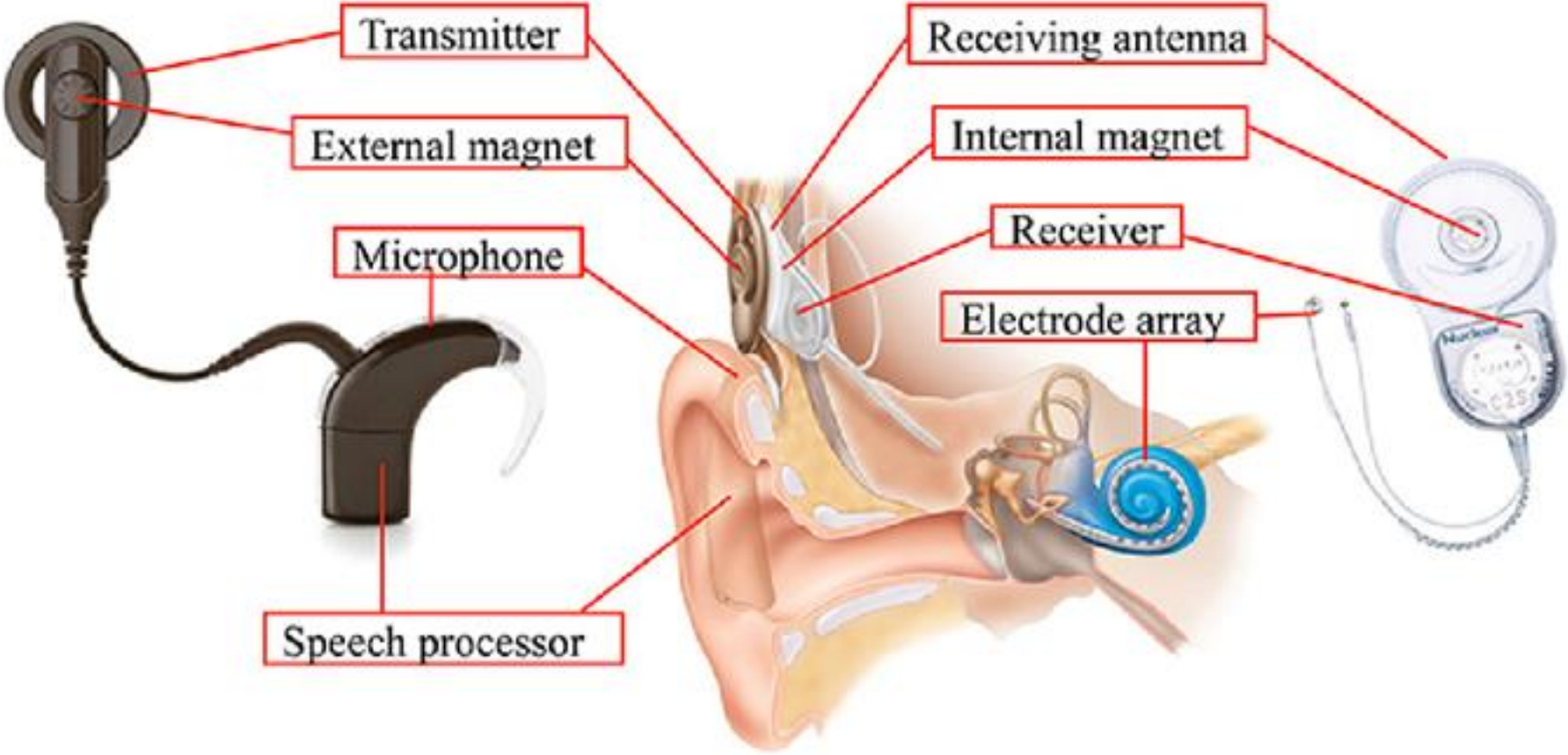
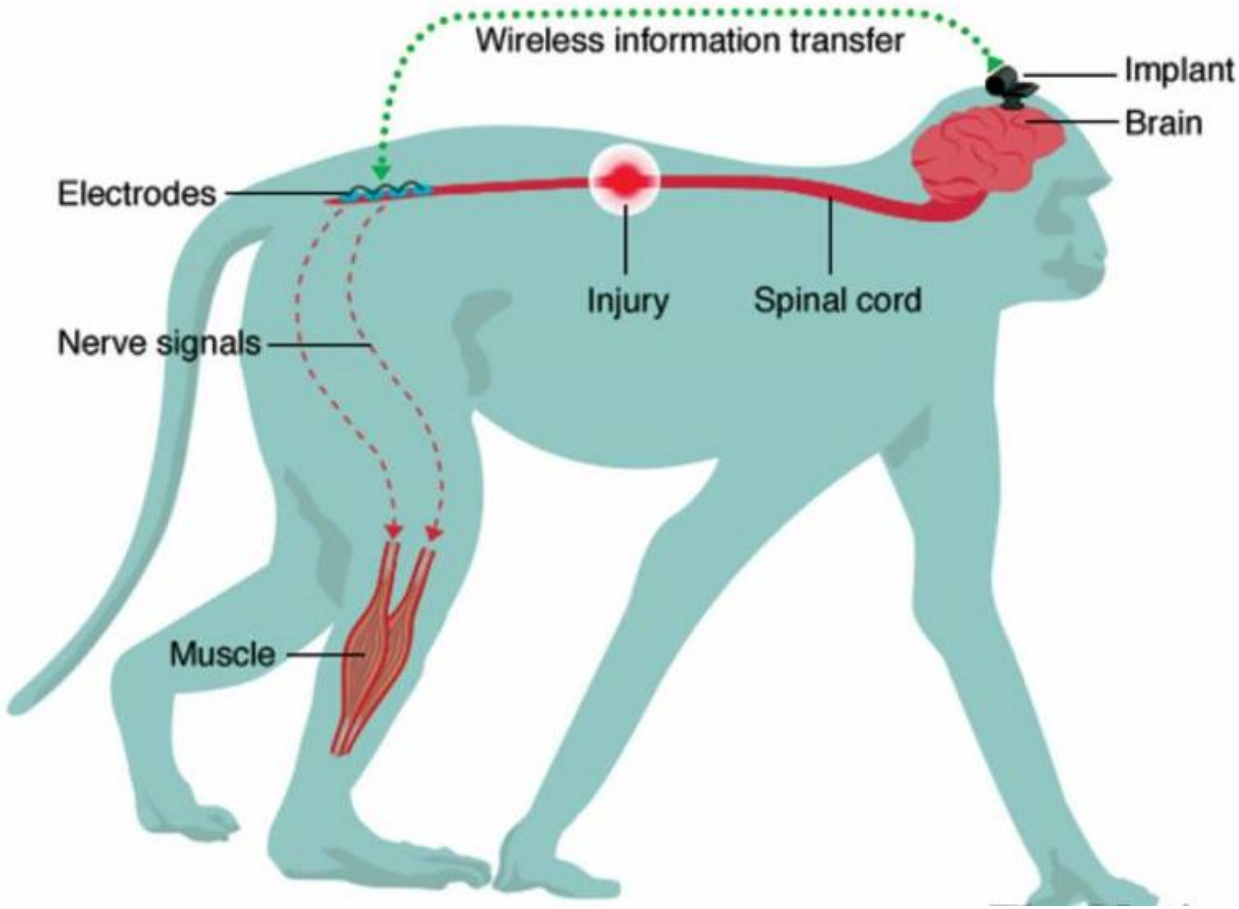
Smegenų ir kompiuterio sąsaja

Dr. Urtė Neniškytė

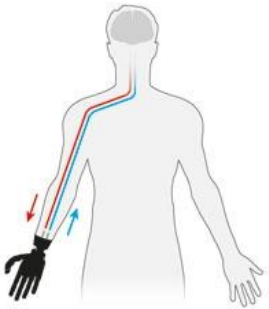



Transmitter
External magnet
Microphone
Speech processor
Receiving antenna
Internal magnet
Receiver
Electrode array


Wireless information transfer
Implant
Brain
Electrodes
Injury
Spinal cord
Nerve signals
Muscle

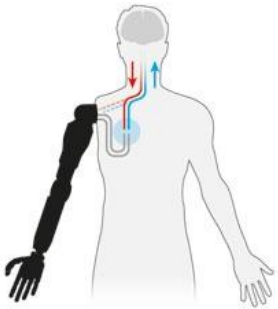
Closing the loop

Prosthetic limbs can be controlled by nerve signals flowing from the brain (→). But fast, fluid motion requires sensory feedback flowing back to the brain (→). Sensor-equipped prosthetics are under development (right), and researchers are exploring several ways to route the output from the sensors into the nervous system (below).



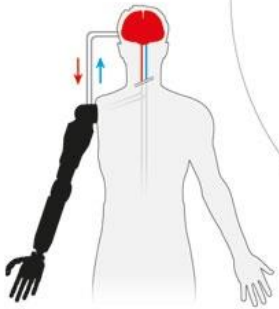
Use the remaining nerves

Electrical leads from the prosthetic's sensors stimulate nerves in the person's stump that once served the real limb.



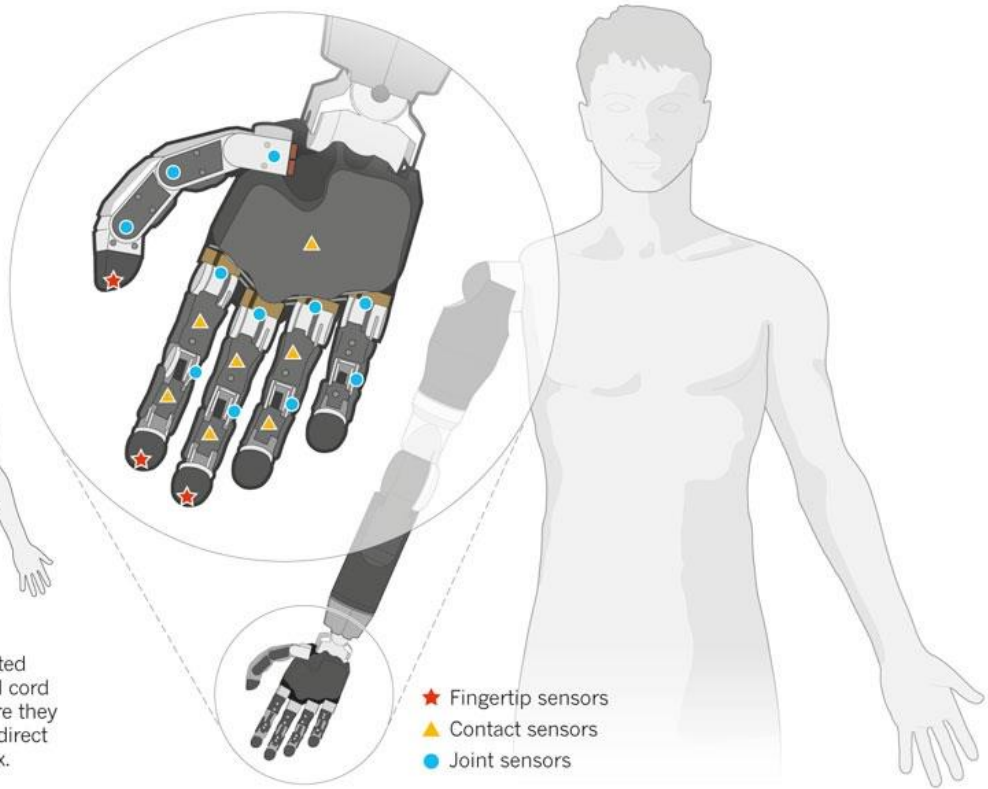
Move the nerves

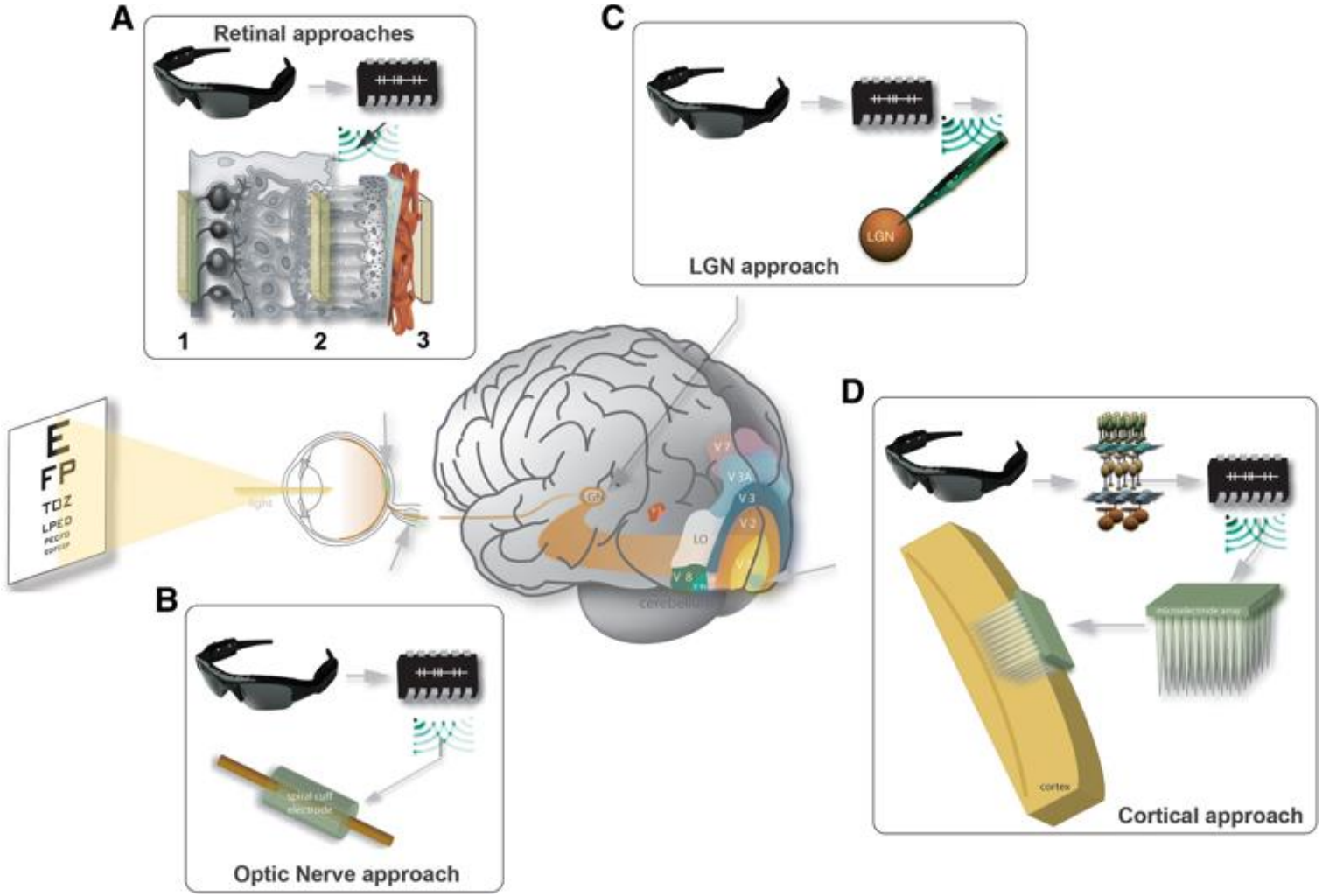
Re-routed nerves grow new endings into muscle and skin, where external devices translate signals going to and from the prosthesis.



Stimulate the brain

Sensory signals are routed around a severed spinal cord and into the brain, where they produce sensations by direct stimulation of the cortex.




A
Retinal approaches
1
2
3
C
LGN
LGN approach
E
FP
TOZ
LPED
PECFD
EDFCP
light
V2
V3A
V3
V2
LO
V8
cerebellum
B
spiral cuff electrode
Optic Nerve approach
D
microelectrode array
cortex
Cortical approach