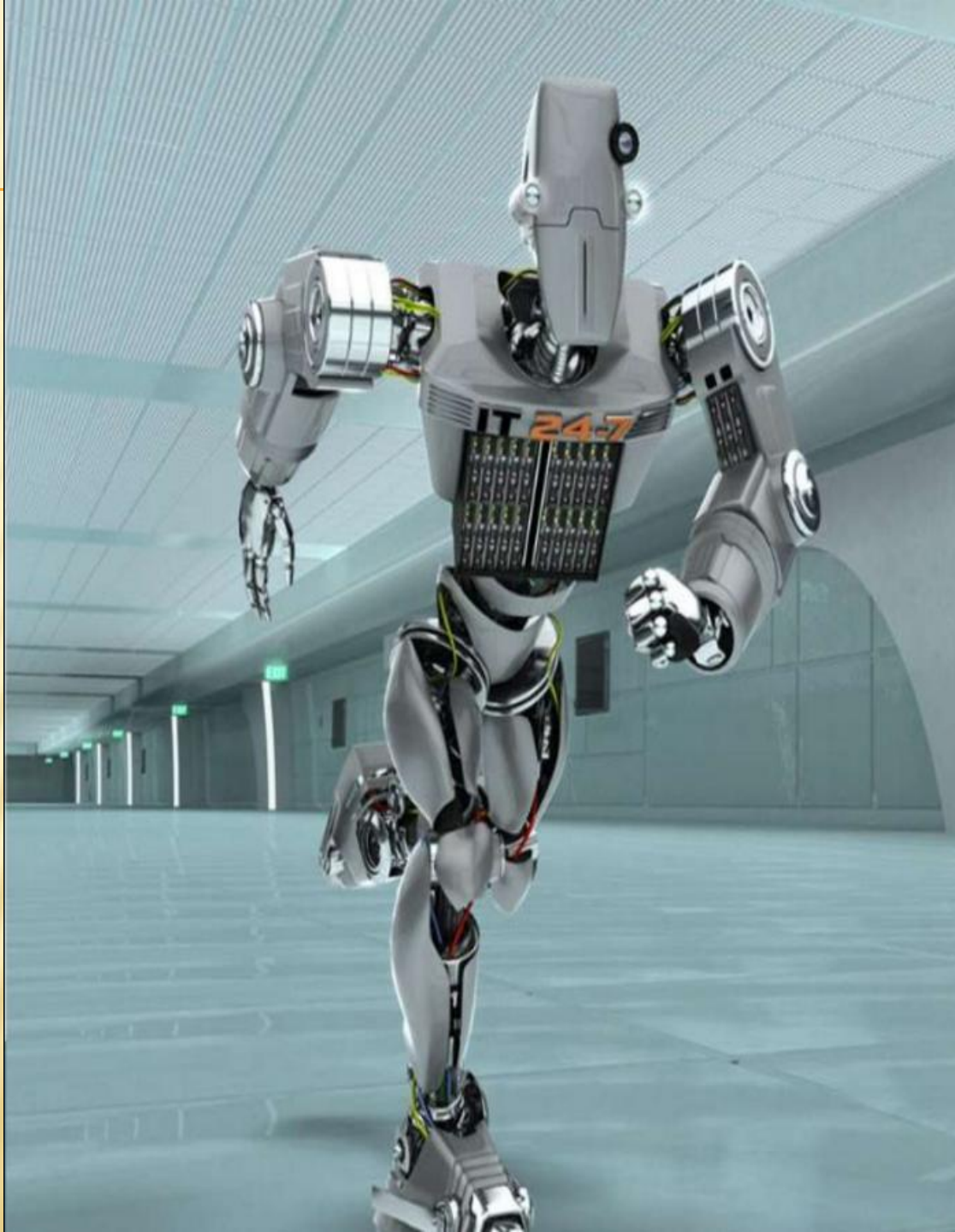


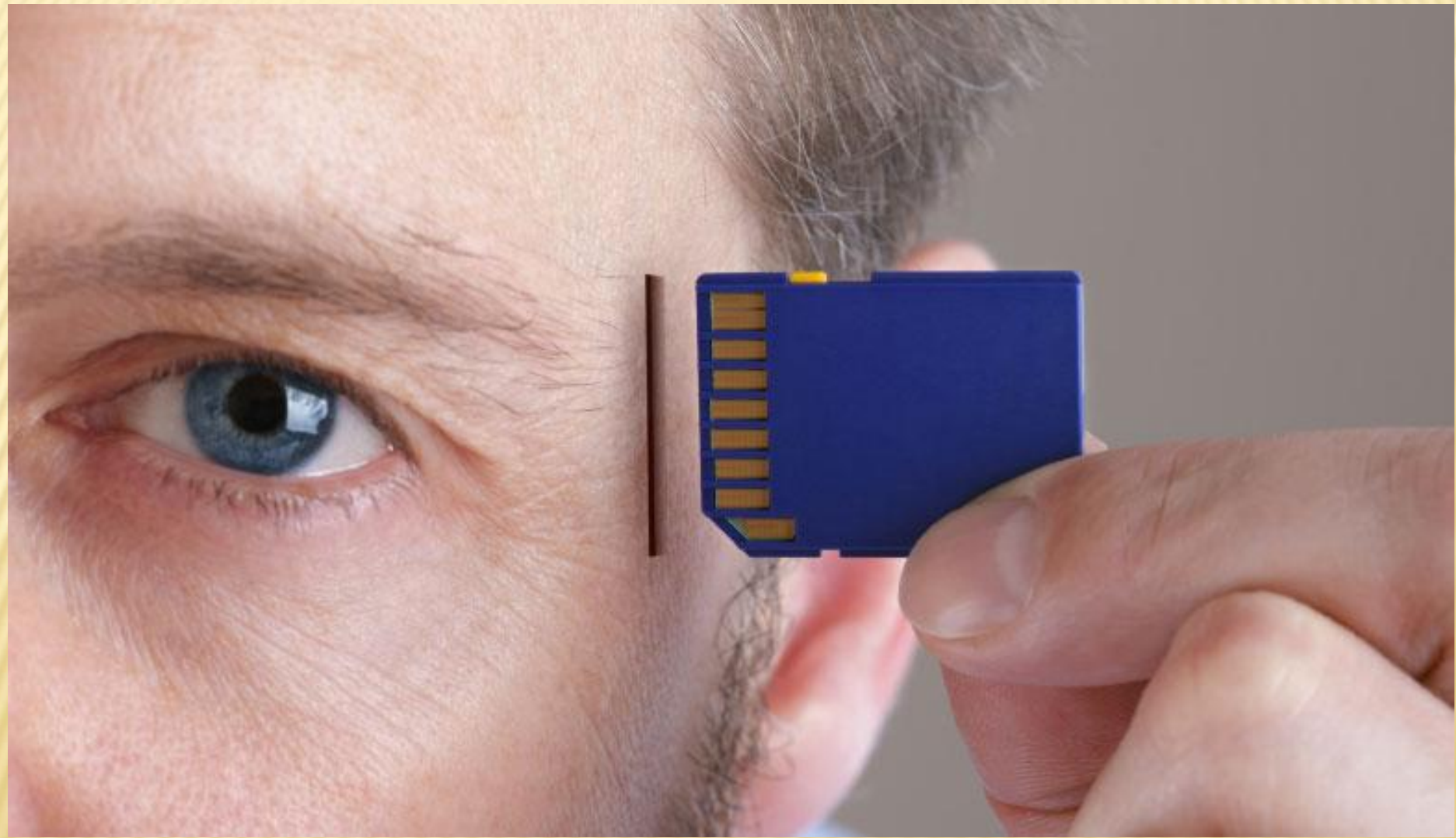


ROBOTICS IN NEUROSCIENCE

Dr. Hemang Shah

5-4-16





DEFINE ROBOTICS

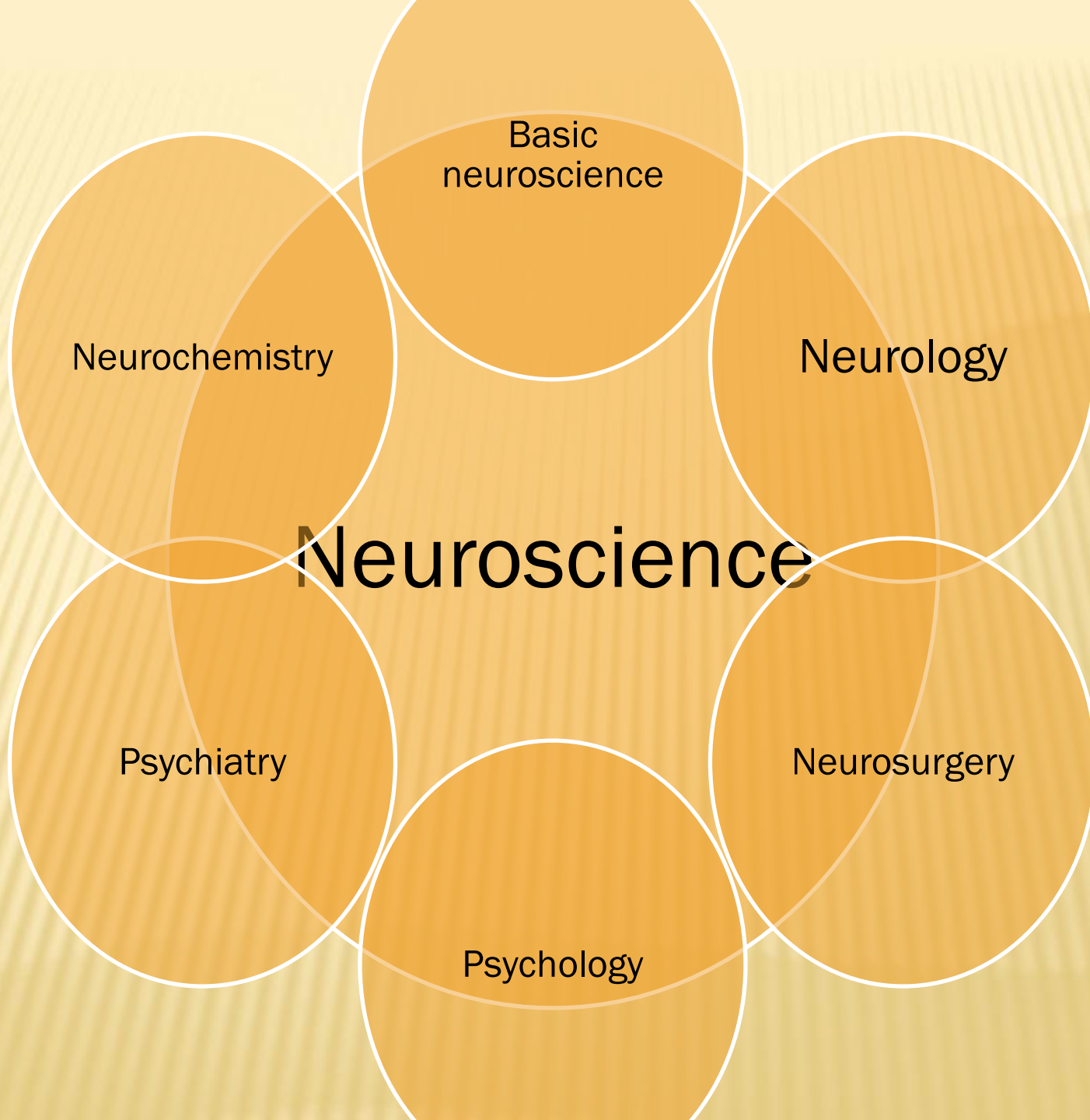
The branch of technology that deals with the design, construction, operation, and application of robots.

WHAT IS A ROBOT?

- ✘ Used to refer to a person who behaves in a mechanical or unemotional manner.
- ✘ A machine resembling a human being and able to replicate certain human movements and functions automatically.
- ✘ A machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer.

Sciences that deal with structure and function of nervous system.

NUEROSCIENCE



Basic
neuroscience

Neurochemistry

Neurology

Neuroscience

Psychiatry

Neurosurgery

Psychology

<input type="checkbox"/> Autonomic Disorders	<input type="checkbox"/> Balance Disorders
<input type="checkbox"/> Behavioral neurology and neuropsychiatry	<input type="checkbox"/> Child Neurology
<input type="checkbox"/> Clinical Research	<input type="checkbox"/> Cognitive disorders
<input type="checkbox"/> Complementary Medicine	<input type="checkbox"/> EEG - Clinical Neurophysiology
<input type="checkbox"/> EMG - Clinical Neurophysiology	<input type="checkbox"/> Epilepsy
<input type="checkbox"/> Geriatric Neurology	<input type="checkbox"/> Headache medicine
<input type="checkbox"/> Intervention neuroradiology	<input type="checkbox"/> Movement Disorders
<input type="checkbox"/> Neural repair and rehabilitation	<input type="checkbox"/> Neuro-Oncology
<input type="checkbox"/> Neuro-Ophthalmology	<input type="checkbox"/> Neuro-Otology
<input type="checkbox"/> Neurocritical Care	<input type="checkbox"/> Neuroendocrinology
<input type="checkbox"/> NeuroGenetics	<input type="checkbox"/> Neurohospitalist
<input type="checkbox"/> Neuroimaging	<input type="checkbox"/> Neuroimmunology (Multiple Sclerosis)
<input type="checkbox"/> Neuromuscular medicine	<input type="checkbox"/> Neuropharmacology
<input type="checkbox"/> Other	<input type="checkbox"/> Pain medicine
<input type="checkbox"/> Sleep Medicine	<input type="checkbox"/> Vascular neurology (stroke)

NORMAL BRAIN LOOKS LIKE

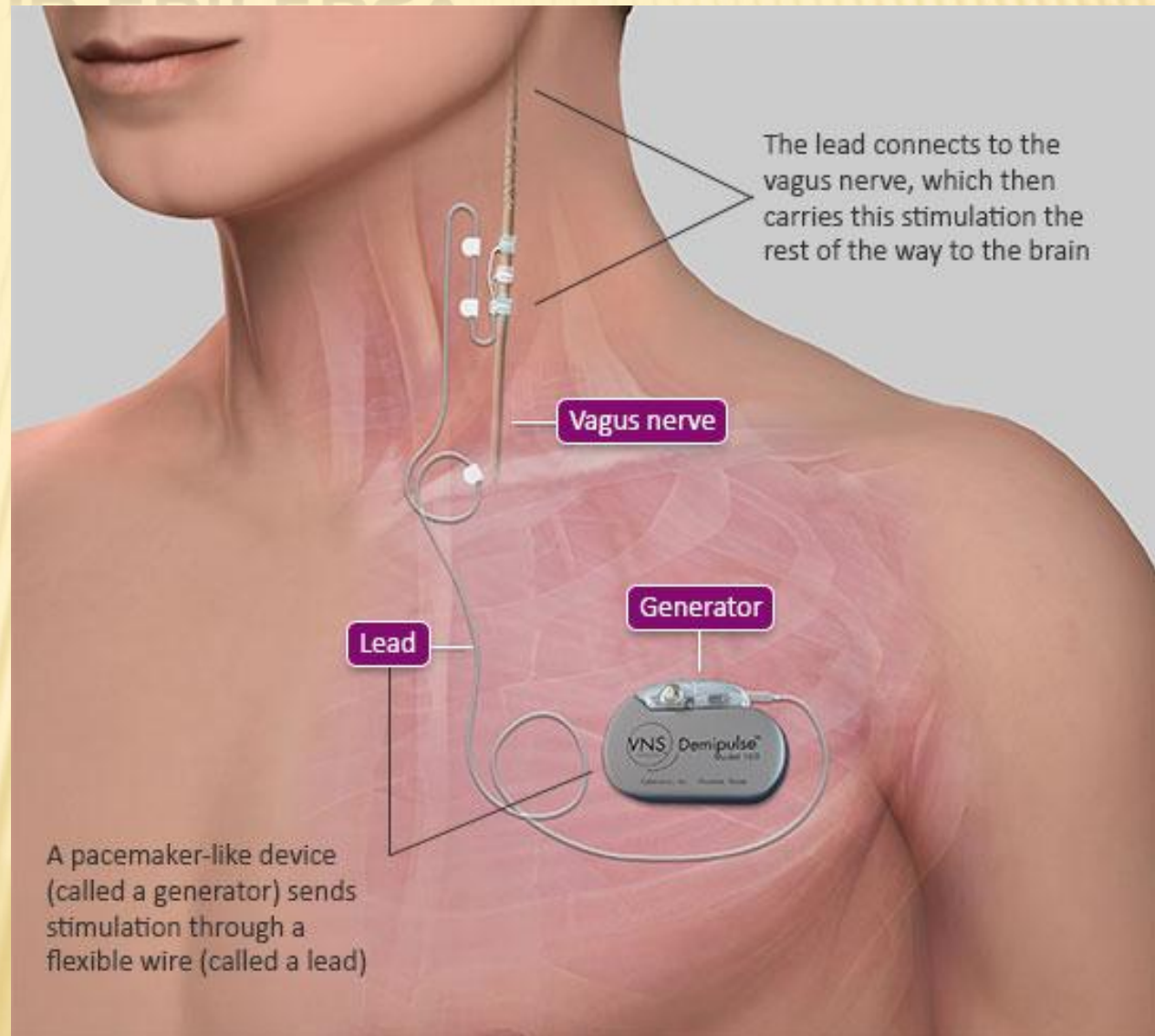
- × Whole Brain Catalogue
- × 3D brain
- × Brain Tutor
- × Normal - 786565

DISEASED BRAIN

- × 759401
- × 684963
- × 780735

ROBOTICS FOR EPILEPSY

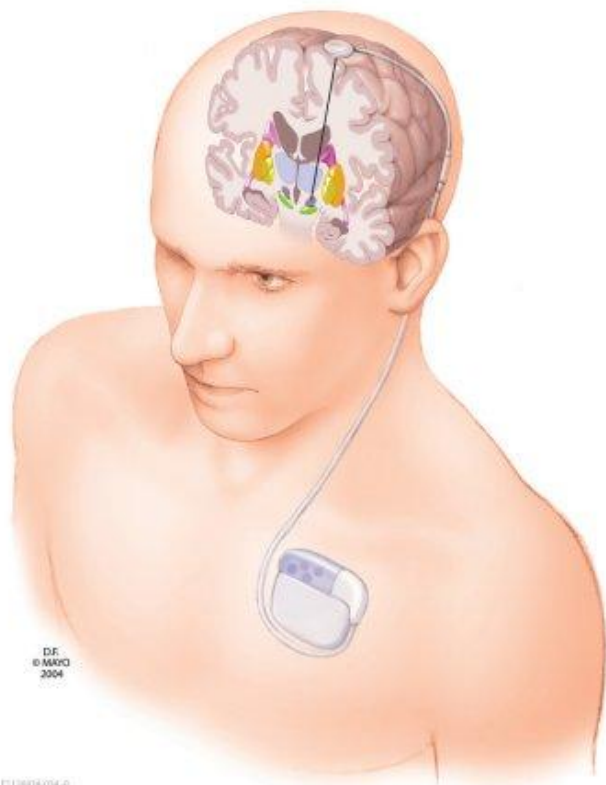
- × VNS
- × JME
- × Drop attack
- × SMA



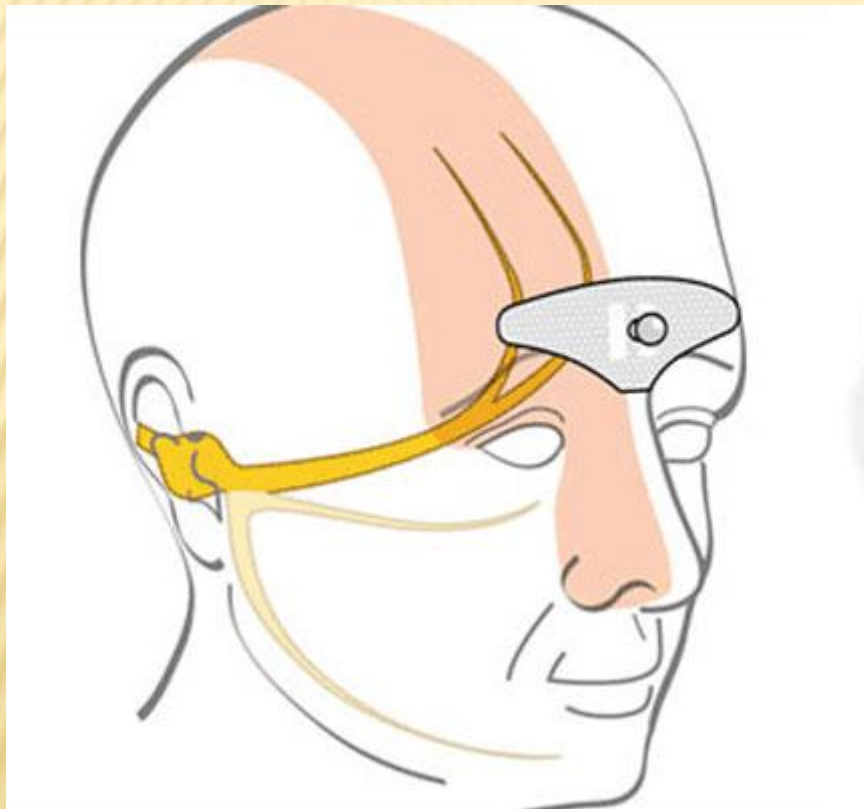




ROBOTICS FOR PARKINSON'S DISEASE



CEFALY FOR HEADACHE



ROBOTICS FOR LEG WEAKNESS



HAND WEAKNESS



Help patients regain
more natural hand function

ROLE OF STEM

Two Large Servo Motors

- + Inbuilt rotation sensor
- + One degree accuracy
- + AutoID



EXTRAS

- + Temperature sensor
- + IR sensor
- + IR beacon
- + WiFi dongle
- + Bluetooth dongle
- + Transformer
- And more to come...

The EV3 Brick

- + Auto detects and control sensors and motors
- + Play sound, display image, control light
- + On brick programming interface
- + Inbuilt Bluetooth

Two Touch Sensors

- + 3 different modes
- + Pressed, released, count number of presses
- + Auto id

..... One Medium Servo Motor

- + Inbuilt rotation sensor
- + One degree accuracy
- + AutoID

**** One Ultrasonic Sensor**

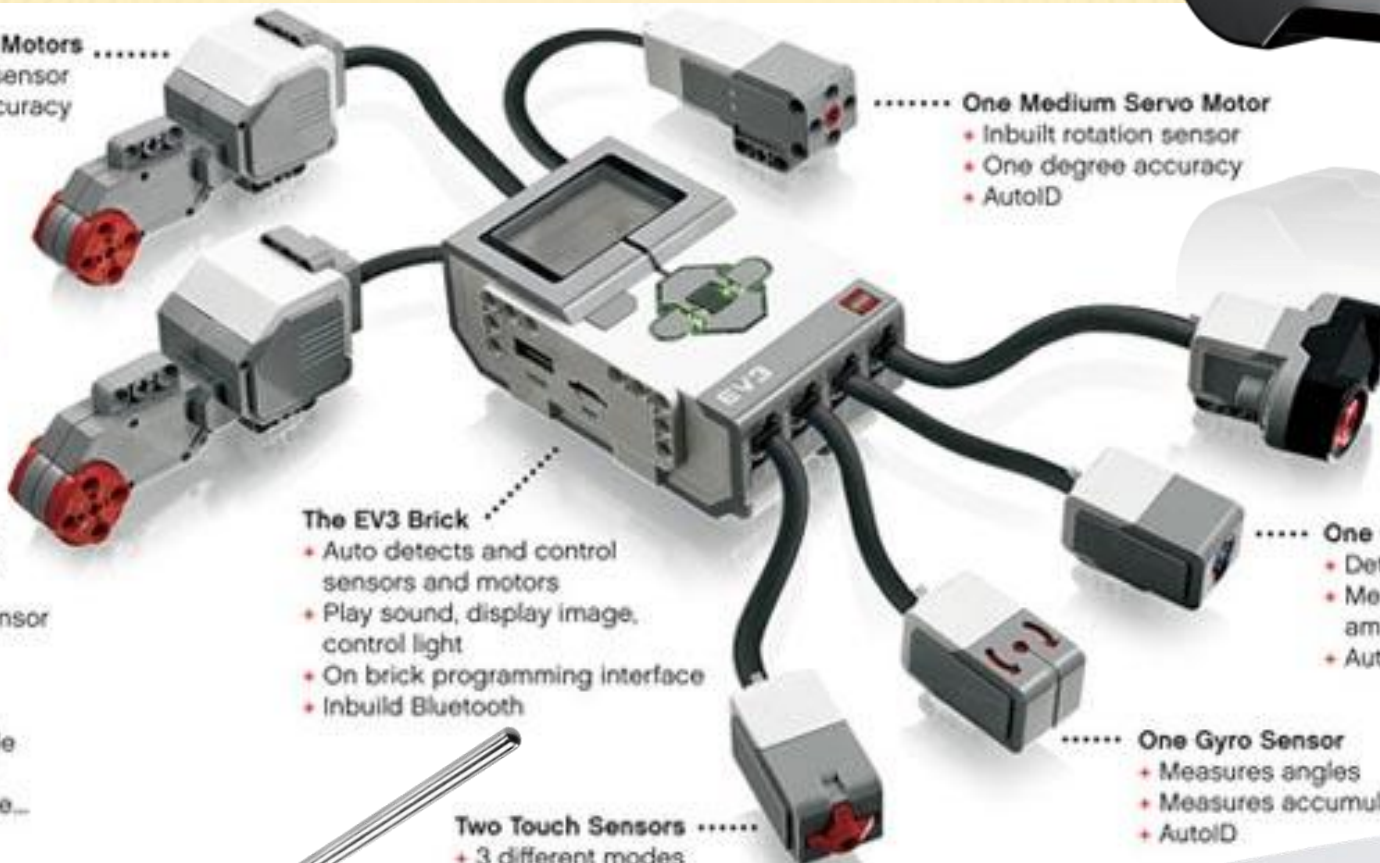
- + Measures distance
- + Detects objects
- + AutoID

..... One Colour Sensor

- + Detects colours
- + Measures light intensity, ambient and reflected light
- + AutoID

..... One Gyro Sensor

- + Measures angles
- + Measures accumulated angles
- + AutoID



ELECTRIC GUITAR



LEGO MINDSTORMS



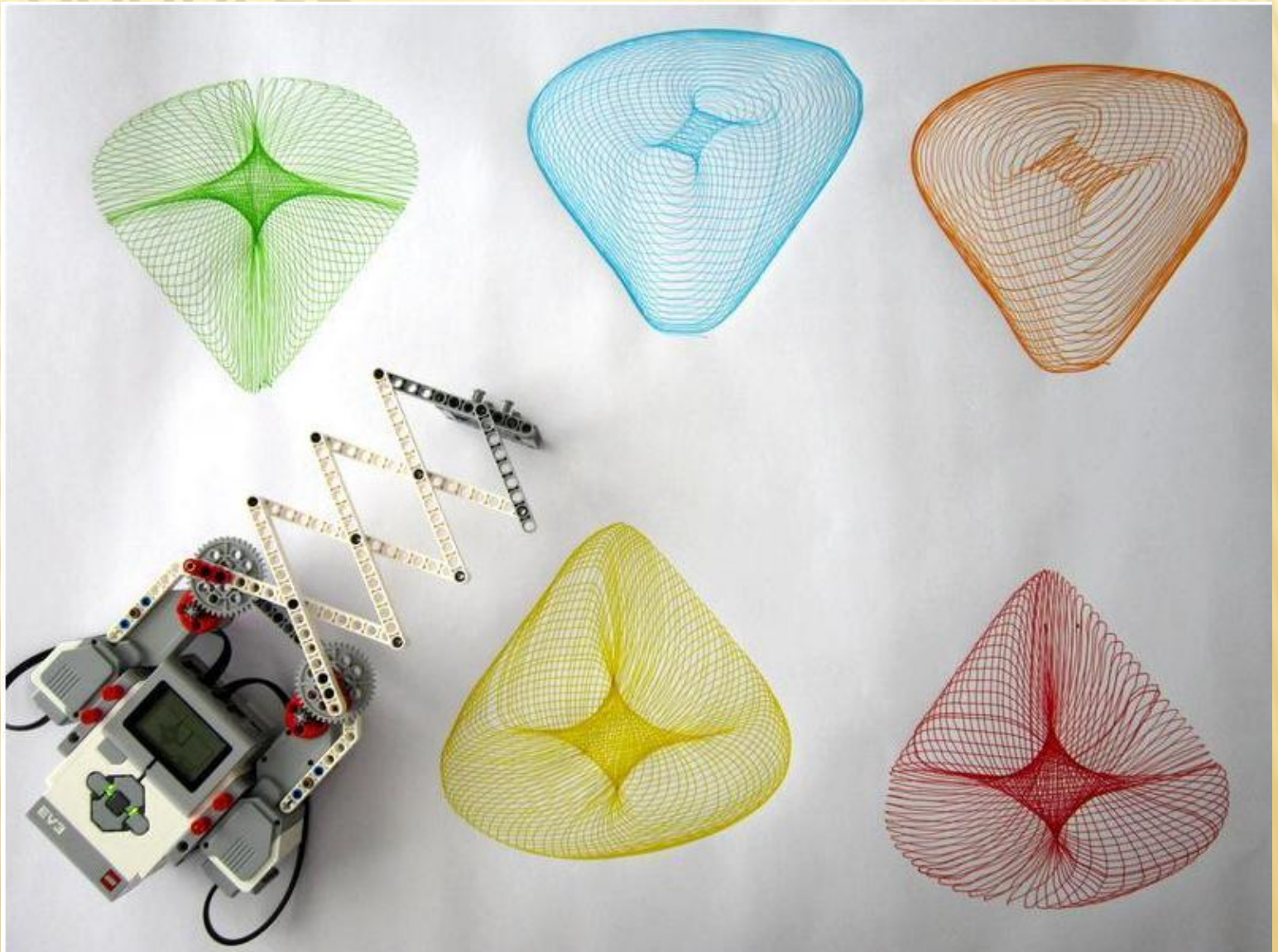
GEARS



WACK 3 M



EV3 DOODLER



M & M SORTER

