
Robo
TRACK
your way into the robotics

Brain Development Ltd.

- Developer and producer of educational equipment for robotics and neuro technologies as well as educational programs for teaching children and young people from kindergarten to university under **Robotrack** trade mark
- Supported by *Ministry of Communications*, *Ministry of Industry and Trade*, *Agency for Strategic Initiatives* and many other

MINISTRY OF INDUSTRY AND TRADE RUSSIA

AGENCY FOR STRATEGIC INITIATIVES

FASIE

ФОНД НАШЕ БУДУЩЕЕ
ФОНД РЕГИОНАЛЬНЫХ СОЦИАЛЬНЫХ ПРОГРАММ

ITMO UNIVERSITY

MOSCOW CITY UNIVERSITY

НЕЙРОНЕТ

Импульс ДОБРА

IYRA
International Youth Robot Association

НОТ

Brain Development Ltd.

Founder of international network of educational centers of technical creativity **Robotrack**, which consists of:

- More than **140** private centers
- More than **5000** government institutions

with more than **70000** children simultaneously in total in:

- **64**/83 regions of *Russian Federation*
- **10** regions of *Republic of Kazakhstan*
- *Republic of Azerbaijan*
- *Republic of Belarus*
- *Kyrgyz Republic*
- *Kingdom of Saudi Arabia*
- *Republic of Singapore*
- *United Arab Emirates*
- *Republic of Uzbekistan*

Robotrack project includes

Training and metodology complex

Equipment

Event ecosystem

- ✓ Children's clubs
- ✓ Competitions
- ✓ Student internships
- ✓ Hackathons
- ✓ Fairs and workshops
- ✓ Resource centers
- ✓ Educational programs

Teacher training

Support for the implementation of the project in the educational space of institutions

Technologies

5 technology training

Robotics

Computer vision

Additive technologies

Programming

Neuro technologies

+ brand new

Neural networks

Robotics

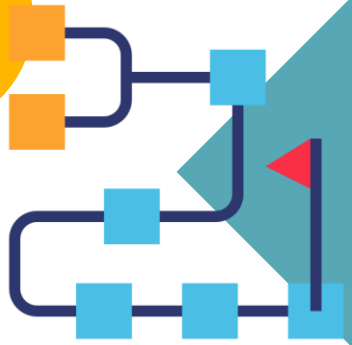
A fully built-up continious process of teaching robotics for children from 4 to 17 y.o. using in accordance to STEM system, including equipment, educational programs, support of teachers, international competitions **DETalka** and **IYRC**

Computer vision

Studying mathematical models of image processing, principles of decoding QR codes; face recognition, geometric shapes. Using computer vision algorithms to control robotic models

Additive technologies

The development of spatial thinking, the study of the principles of 3D printers, training in the creation of three-dimensional models and their preparation for printing on any equipment



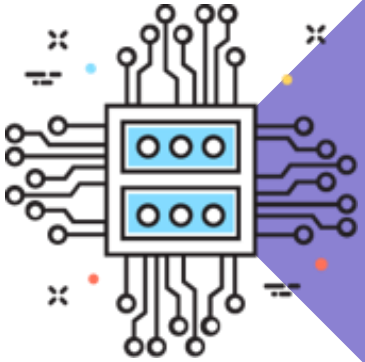
Programming

Studying the basis of programming on such programming languages as:

- Scratch
- Python
- C++
- Java

Neuro technologies

Digital educational complex, which is designed for formation of knowledge and skills in children and preparation for future specialties related to medicine (**neuro**- и **psychophysiology**, **neurobiology**), **NBIC**-technologies, bioengineering, programming, robotics and digital economy, **AI**, **VR**, and **AR**



Neural networks

Hardware-software complex to learn basics of neural networks and run them on especially developed computing module which allows to be controlled by Trackduino and to send a response of neural network to it

Equipment

Wiki-tutorials

SCAN ME

Robotrack's constructor kits

Kiddy 1
- 4-5 y.o.
- >277 parts

Kiddy 2
- 5-6 y.o.
- >302 parts

Intern A
- 7-9 y.o.
- >667 parts

My robot
- 10-11 y.o.
- >651 parts

Base
- 12-16 y.o.
- >828 parts

Engineer
- 17+ y.o.
- >2041 parts

Robotrack's resource kits

Neurotrack | Videretrack | Energytrack | Wheels and caterpillars | Temperature sensor | Kiddy project | Shafts and gears

Worm-gear | Fasteners | Metal | Audiotrack | CFLF | Tenzotrack

Bend sensor | Servomotor | DC motor | Trackduino
Trackduino Pro | TFT color touch screen | Plastic | Sensors

Equipment of "Young neurophysiologist-engineer"

Neurotrack

- 10-14 y.o.

Neuro headset

- EEG of human brain

Electric headset

- ECG
- EMG
- PPG

P-300

- Reaction on visual presentations

CFLF

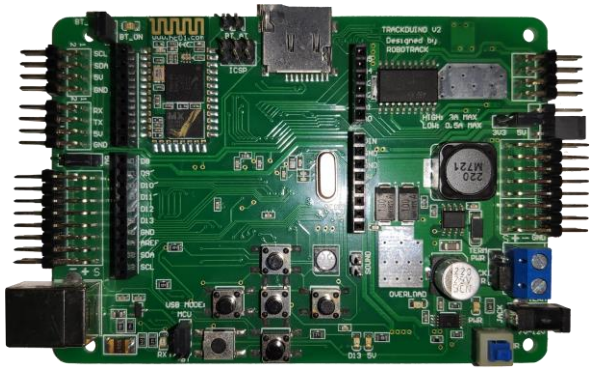
- Critical frequency of light flickering
- Fatigability laboratory

With the aim of Russia's competitiveness in the global technology market and the formation of a digital economy, **Brain Development** has developed and implemented a project «**Young neurophysiologist-engineer**»

Trackduino microcontroller

- Atmega2560
- Arduino Uno interface
- 8x Input ports
- 8x Output ports
- 2x UART
- 2x I2C
- 4x Motor ports
- Bluetooth
- MicroSD
- Built-in RGB LED

C++



Visual blocks

Training courses

Demo lessons

SCAN ME

Complex of training courses

A lesson lasts 100 minutes

Kiddy 1

- 4-6 y.o.
- 45 lessons

Kiddy 2

- 6-7 y.o.
- 40 lessons

Intern A

- 7-10 y.o.
- 75 lessons

Introduction to cognitive science

- 9+ y.o.
- 15 lessons

Programming in Scratch

- 10-11 y.o.
- 15 lessons

My robot

- 10-11 y.o.
- 20 lessons

Additive technologies

- 11 y.o.
- 11 lessons

Programming in Python

- 11 y.o.
- 42 lessons

Base

- 12-16 y.o.
- 62 lessons

Programming in C++

- 12+ y.o.
- 20+ lessons

Computer vision

- 12+ y.o.
- 30 lessons

Young neurophysiologist-engineer

- 15+ y.o.
- 64 lessons

The scope of the complex

Preschool, general, special and higher education

Inclusion in the educational process, the formation of competencies for specialties of the future

Centers for continuing education

Competition preparation, hobby classes, organization of STEM education

Private schools

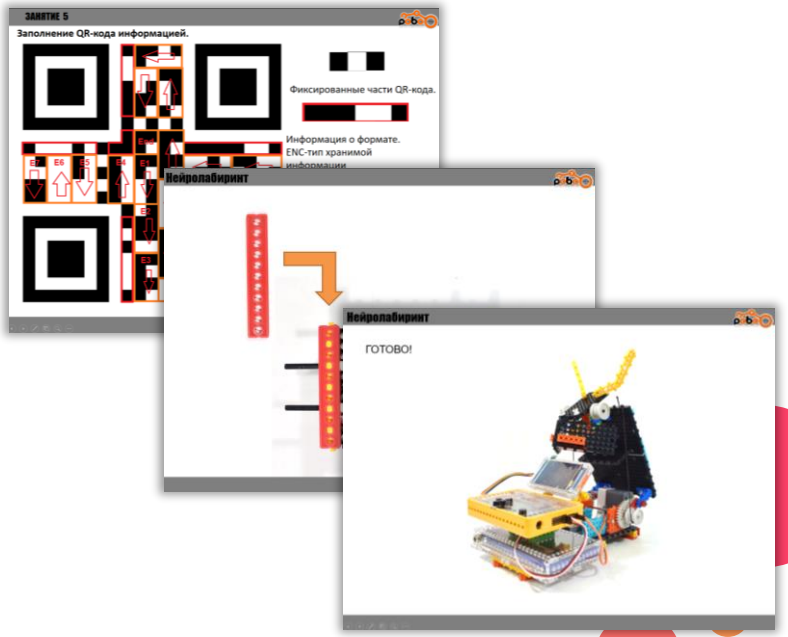
Profile classes in STEM-subjects, preparation for the olympiads, the formation of the portfolio and competencies of future specialties

Children's camps

Profile shifts in engineering, competitions, organization of project activities

Structure of courses

- Presentation materials for the teacher
- Detailed assembly maps of robotic models
- Video of the assembled model
- Lesson Plans
- Explanatory notes
- Program examples
- Additional materials for classes:
  - Educational videos
  - Links to literature / Internet resources



Support

- Continuing education courses for teachers in the organization of the educational process and equipment maintenance
- Continuous updating of techniques, software and equipment
- Access to new developing technologies
- The opportunity to participate in international competitions in robotics and neurotechnology **DETalka** and **IYRC**
- Supporting institutions and the pedagogical community in the implementation of the complex

Young neurophysiologist-engineer

Equipment

Academic and methodological course

CRM (data processing center)

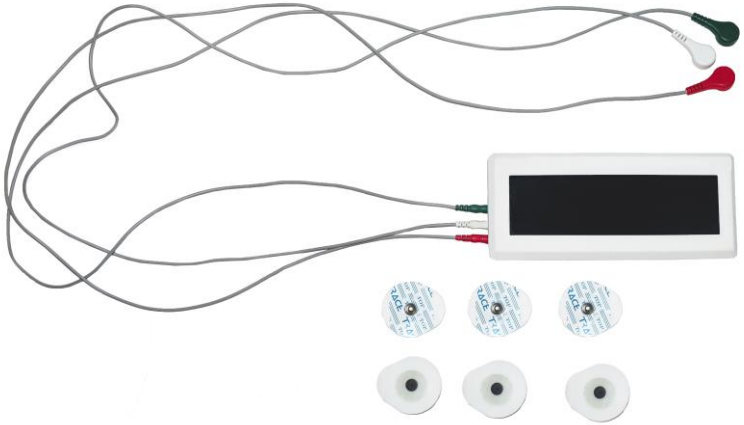
Statistics and remote computations block

Teachers’ education on career enhancement courses

Young neurophysiologist-engineer

Neuro headset

8 "dry" electrodes to record EEG



Electro headset

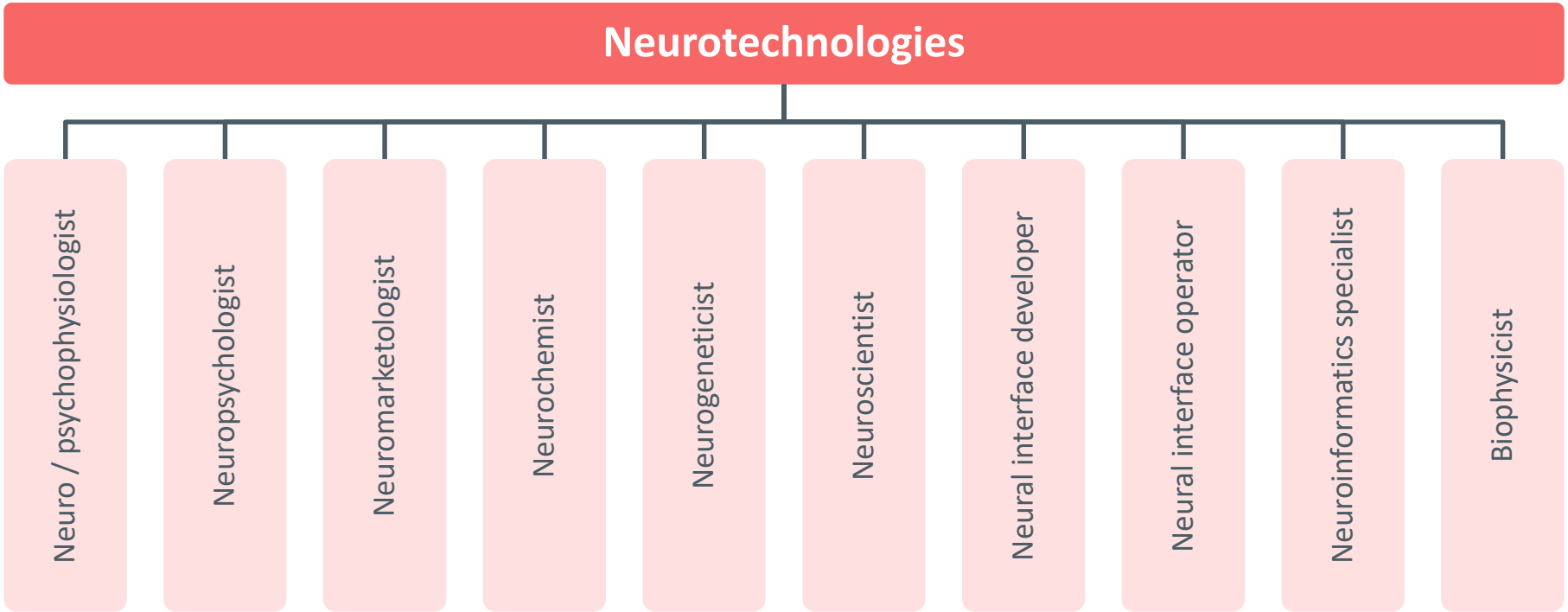
Possibility to record ECG, EMG, EDA, PPG

High-quality signal

Wireless data transmission

Polygraph system

Popular and future professions



Competencies and skills

To explore the field of neuro- and psychophysiology of human

To use personal indications of the bioelectric activity of the body to control robotic models

Basics of psychophysiology and human's functional state

Knowledge of concept of biofeedback and its practical usage

Knowledge of structure of the cardiovascular system and the heart

To determine very own heart pulse and to plot personal axis of the heart

Knowledge of the structure and constitution of human's skin and its electrical conductivity

Knowledge of the structure of human muscles and the functional state of muscle tissue and nerves via the registration of bioelectric activity

Contact us

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