



UNIVERSITÀ DI PISA



IRCCS FONDAZIONE
STELLA MARIS

per la Neuropsichiatria dell'Infanzia e dell'Adolescenza

Contribution of molecular, imaging and
IC technologies to developmental neuroscience

Andrea Guzzetta

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Neurodevelopmental Disorders (NDDs)

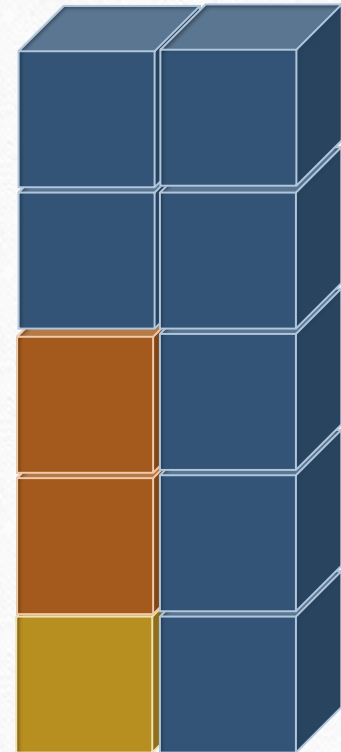
In the DSM-V the new cluster of NDDs is proposed, which includes six categories:

- Intellectual Developmental Disorders
- Communication Disorders
- Autism Spectrum Disorders
- Attention Deficit/Hyperactivity Disorder
- Learning Disorders
- Motor Disorders

SEVERE FORMS
WITH MULTIPLE DISABILITIES

+ MODERATE FORMS

+ MILD FORMS



>1,000,000 children in Italy



DIAGNOSIS



THERAPY

**TOMOGRAPHER
ORDERED**

'09

FROM **F**IRST **S**TONE

TO **F**IRST **I**MAGE

**INFRASTRUCTURES
COMPLETED**

'10

**MAGNET DELIVERED
7 TESLA REACHED**

'11

**FIRST
HUMAN IMAGES**

'12

**OFFICIAL OPENING
OF THE CENTRE**

'13



IMAGO7



Research Activity

Current research activity

- Design, construction and testing of radio frequency coils for magnetic resonance systems at 7T
- Design and development of pulse sequences for data acquisition and imaging techniques at 7T
- Safety assessment of magnetic resonance systems at ultra-high field for future employment in developmental age
- Clinical impact of ultra high-field MRI in neurodegenerative diseases diagnosis (Grant of the Italian Ministry of Health)
- Evaluation of dysplastic and tumoral cortical dysembryoplastic lesions by targeted magnetic resonance imaging at ultra-high fields (Project funded by Fondazione Pisa)

Planned research topics

- Development of protocols for employment of magnetic resonance at ultra-high field in pediatric age
- Imaging and spectroscopy of neuromuscular pathologies
- Functional mapping of the columnar architecture in human cortex

How to present a research proposal to Imago7

Researchers of other Institutes that have interest in using the resources of Imago7 are invited to present their project to the Scientific Committee for preliminary feasibility assessment: segreteriaRM7T@imago7.eu

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Calambrone
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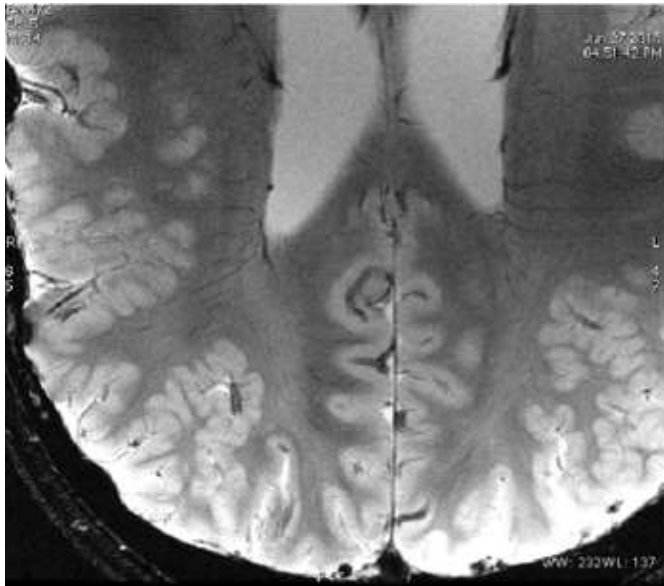
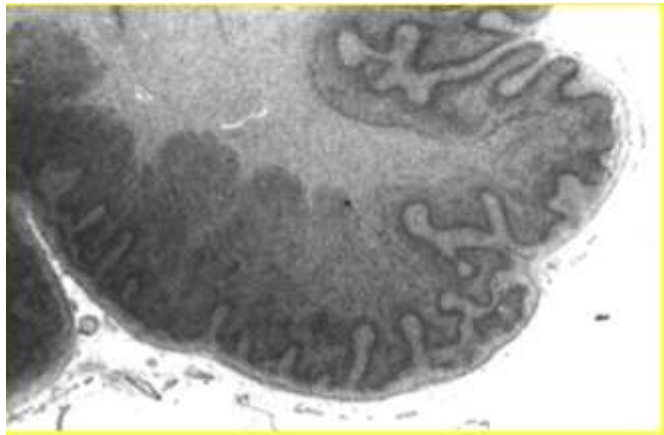
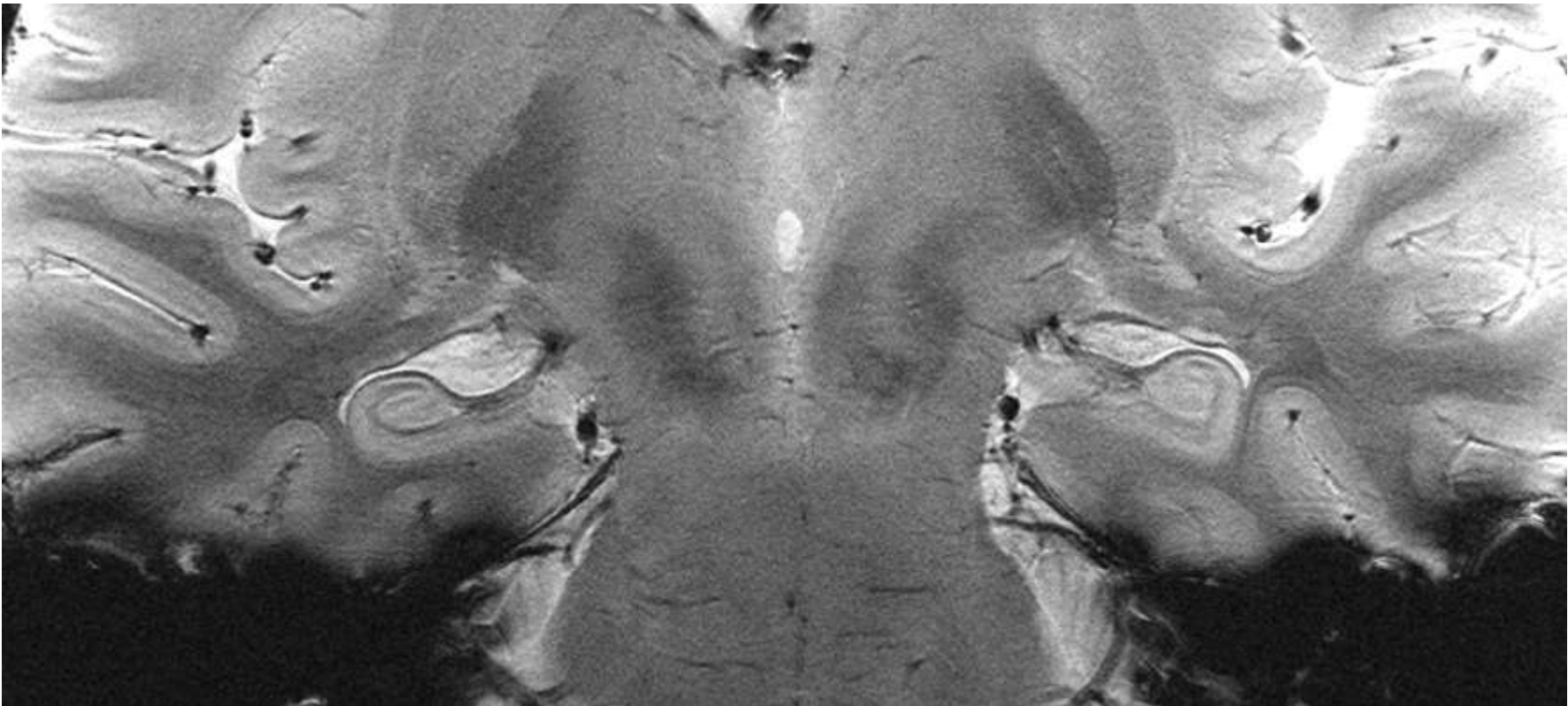


IRCCS Medea
Bosisio Parini
Lecco

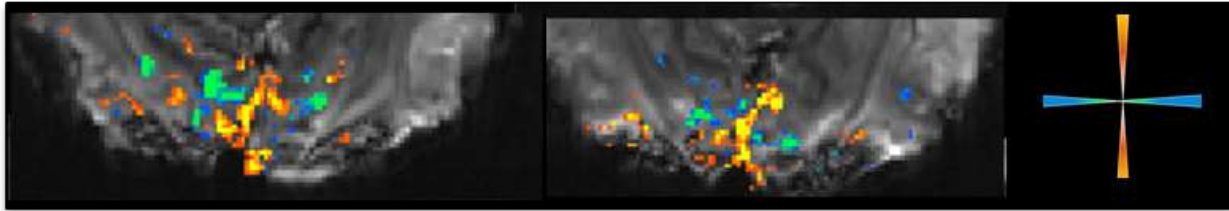
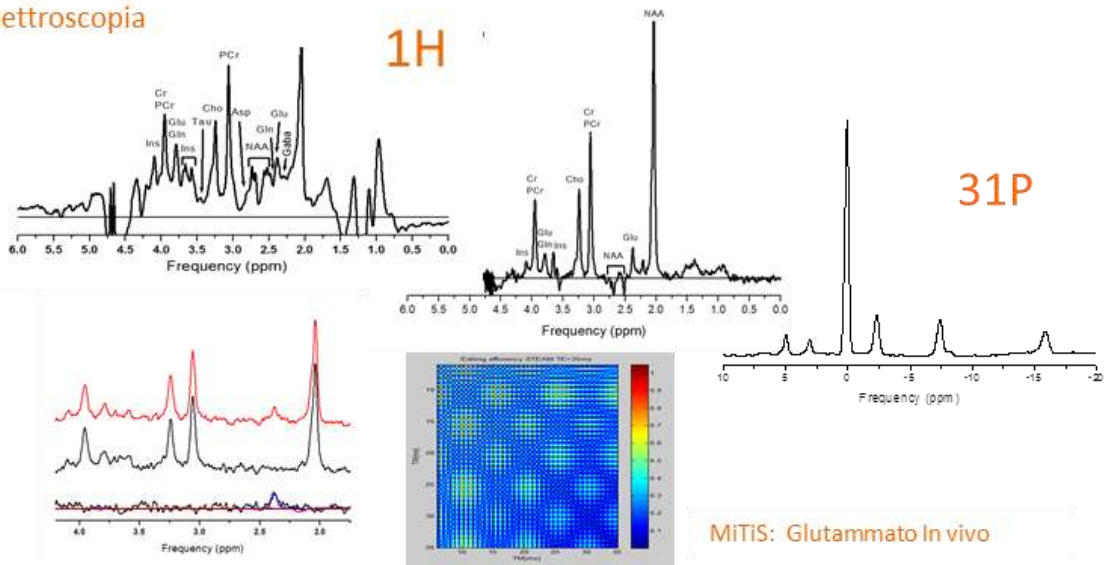


Under the patronage of



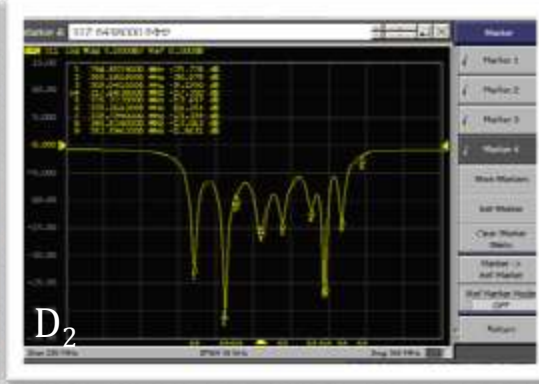
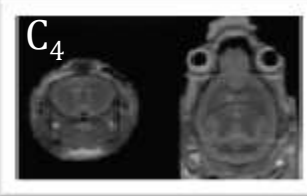
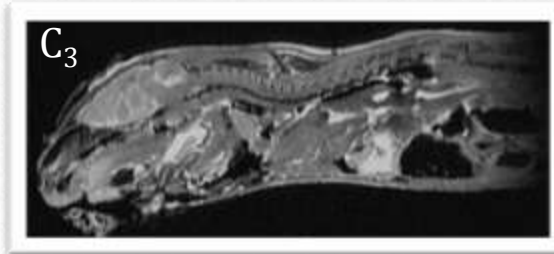
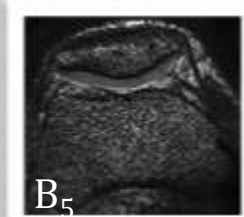
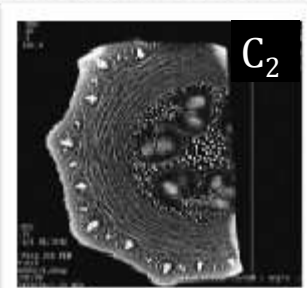
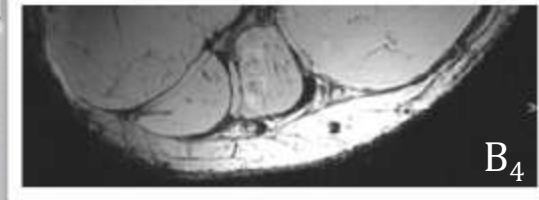
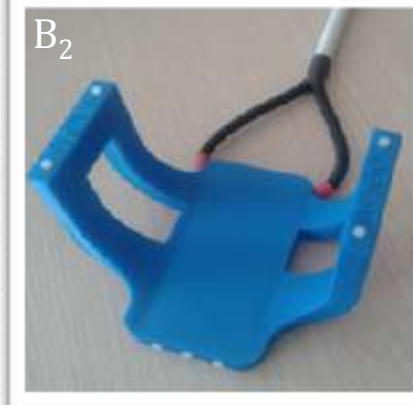
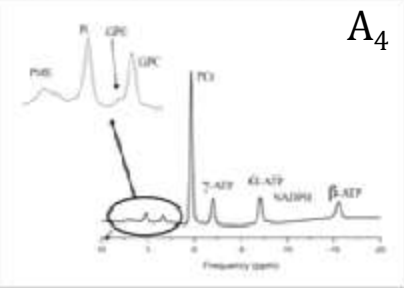
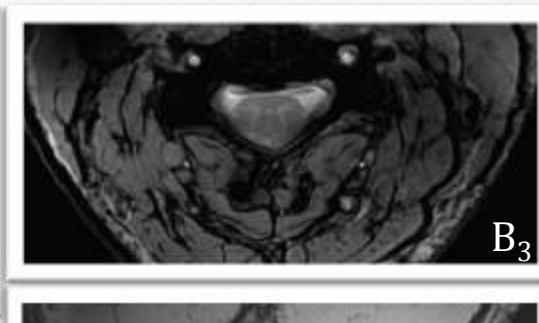
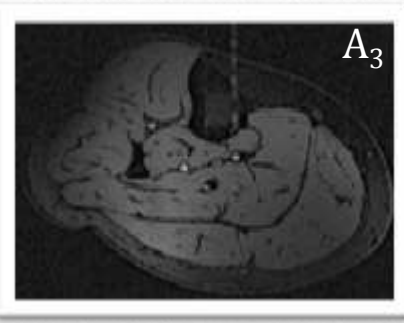
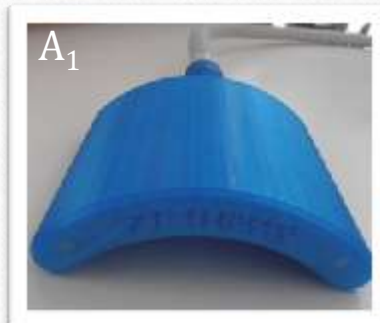


Spettroscopia

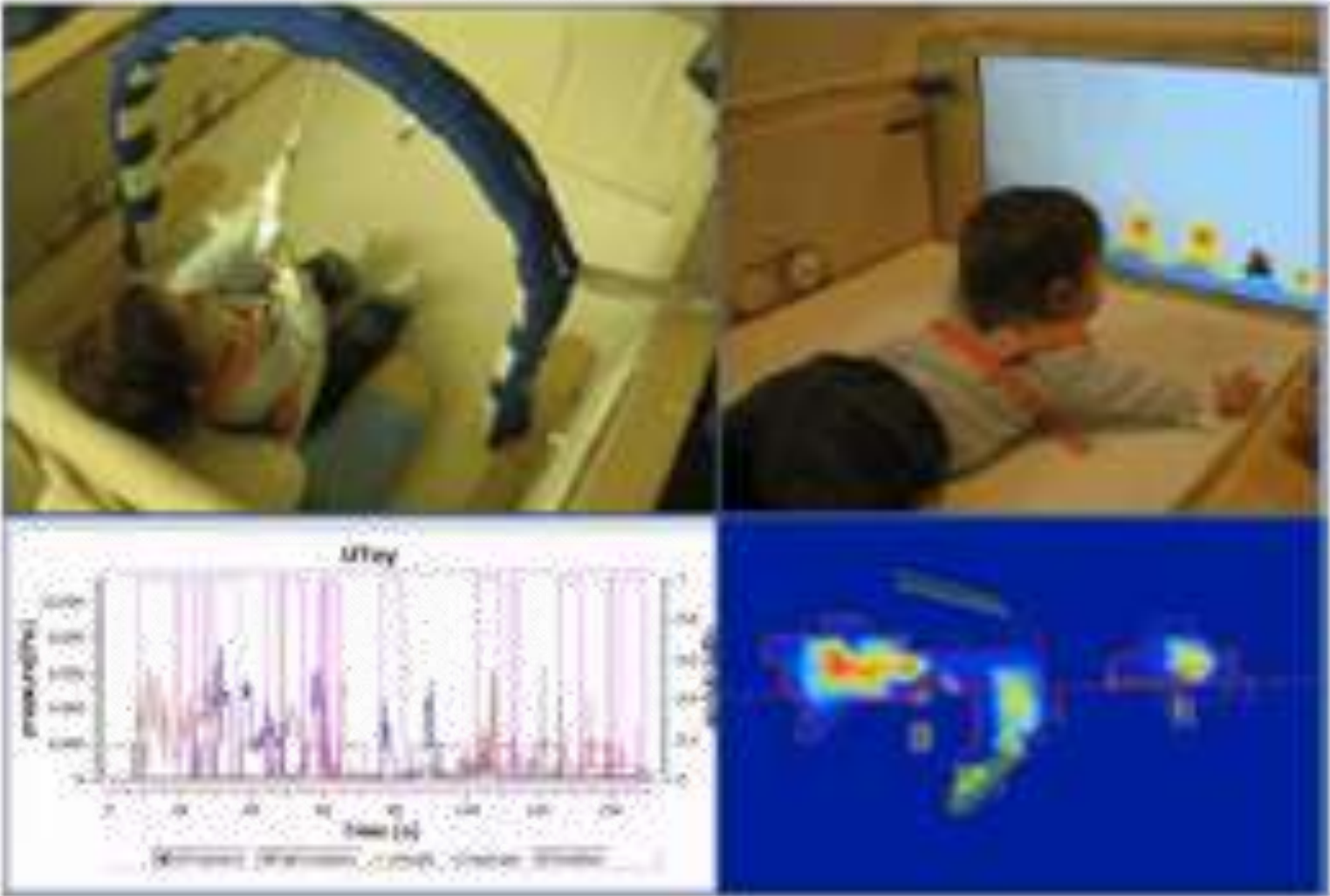


fMRI nella corteccia visiva

In collaboration with INFN and GE IMAGO7 Center is developing in his lab new radio-coils suitable for 7T signals reception and transmission.



INFORMATION
COMMUNICATION
TECHNOLOGIES FOR
**INTENSIVE HOME
TREATMENT** IN INFANTS
WITH AUTISM OR OTHER
NDDS



INFORMATION
COMMUNICATION
TECHNOLOGIES FOR
**INTENSIVE HOME
TREATMENT IN
CHILDREN AND
ADOLESCENTS WITH
LEARNING DISABILITIES**

PEARSON

ALWAYS LEARNING

CONSUMERS EDUCATORS HEALTH CARE PROFESSIONALS



SEARCH

Training Method [Training Products](#) How it Works How Cogmed is Different Pricing

Training Products

Cogmed Working Memory Training is built around three age-specific software applications



Each program is proven to improve working memory and strengthen executive functions.

The training consists of a specific set of working memory tasks that are performed on a computer, at school, at home, or the user's place of choice, where the difficulty level is adjusted according to a highly sensitive and specific algorithm.

Each user is required to complete eight exercises every day, taking about 30-45 minutes for the entire session. This is done for five days a week over five weeks (there are now variations to that protocol available in beta). During training, the user's performance is tracked online and can be viewed by the user and his/her Cogmed Coach who communicates with the user throughout the five weeks to assist him/her through the program.

All the products share the same underlying design and algorithms – the differences are in the user interface. [System requirements.](#)



Cogmed JM - for Pre-schoolers



Cogmed RM - for School-age



Cogmed QM - for Adults

INFORMATION
COMMUNICATION
TECHNOLOGIES FOR
**INTENSIVE HOME
TREATMENT IN
CHILDREN WITH
CEREBRAL VISUAL
IMPAIRMENT**

binari
engineering

AvDesk V.2

AvDesk V.2 è un pannello interattivo dal quale vengono emessi stimoli audiovisivi secondo ricette mediche specifiche per il paziente. Il sistema è facilmente trasportabile e utilizzabile a domicilio grazie al pannello che viene riposto all'interno dell'apposita custodia.



Grazie alla stimolazione prodotta da AvDesk V.2, si possono curare i pazienti affetti da emianopsia o da quadrantopsia. Il sistema è concepito in modo che siano programmabili differenti terapie, adatte alle diverse patologie del sistema visivo di adulti e bambini.

Il pannello interattivo è suddiviso in 12 segmenti dotati di speakers e led RGB che generano sequenze di stimoli uditivi e visivi ai quali il paziente risponde semplicemente premendo un pulsante wireless posto di fronte a lui.



Per garantire la massima efficacia della terapia il sistema acquisisce in tempo reale la posizione del capo e degli occhi del paziente con sensori MEMS e eye-tracking. I risultati giornalieri della cura sono inviati automaticamente a un portale WEB attraverso il quale il medico provvederà a fornire una valutazione e la terapia per il giorno successivo.