Dextrain develops manual dexterity technology and machine learning analysis to improve neuro-recovery and prediction, enhancing daily life of millions of individuals.
Rehabilitation of manual dexterity:

Enhance independence and quality of life for as many individuals as possible with significant impact on public health.

« With our hands we interact with the world, create and communicate »

OUR MISSION

Dextrain:

1. Neuroscience-inspired technology for the treatment of dexterity
2. Creation of a normative database of dexterity to improve diagnosis
3. A collaborative platform to continuously optimize rehabilitation protocols

OUR SOLUTIONS PROVIDE:

1. Early detection and improved follow-up of neurological hand impairments
2. Intense targeted training through personalized exercises based on neuroscience
OUR VISION
RECOVERY AND PREDICTION

DEXTERITY TOOLS

- DEXTRAIN MANIPULANDUM
  - Neurological Disorders
    - Stroke

- DEXTRAIN HOME CARE
  - Neurodegenerative and Neurodevelopmental disorders
    - Alzheimer’s disease
    - Schizophrenia

SOFTWARE

- Interative testing and reporting

NORMATIVE DATA PLATFORM

- Protocol Library
  - Accurate assessment and follow-up
  - Individually tailored treatment
  - Intense and motivational training

- Machine Learning
  - Sensorimotor and Cognitive Profiling
  - Prediction

Home Care

Dextrain
EVERY YEAR,
100 MILLION NEW PATIENTS WILL NEED A DEXTRAIN ASSESSMENT AND REHABILITATION

REHABILITATION

<table>
<thead>
<tr>
<th>Category</th>
<th>Patients/YEAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>16M</td>
</tr>
<tr>
<td>Multiple sclerosis</td>
<td>3M</td>
</tr>
<tr>
<td>Orthopedic/Rheumatology</td>
<td>16M</td>
</tr>
<tr>
<td>Parkinson</td>
<td>7M</td>
</tr>
<tr>
<td>Alzheimer</td>
<td>35M</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>22M</td>
</tr>
</tbody>
</table>

100 MILLIONS OF NEW PATIENTS/YEAR
**MARKET SIZE**

**Key figures**

**Stroke:** 97 Billion Euros in western countries and 13 Billion in rehabilitation in 2020

**Neurologic Rehabilitation**
- 6000 specialized centers in Western Countries
- 1.5 Bil€ in Europe
- 3 Bil€ in USA

**Orthopedic Rehabilitation**
- 22 000 specialists
- 4.2 Bil€ in Physiotherapists

**Predictive assessment of neurodegenerative & psychiatric disease**

- **Alzheimer's disease**
  - Over 70 000 elderly houses in western countries
- **Schizophrenia**
  - Over 150 000 psy & over 10 000 specialized centers in western countries

**Diagrams:**
- Alzheimer's: 733 Bil€
- Schizophrenia: 150 Bil€
- Parkinson's: 50 Bil€
Music glove:
- Low price
- Measures less aspects of dexterity
- Less sensitive

Fingers in motion:
- Tablet games for dexterity
- Low sophistication
- Expensive (3300 € for 5 games)
- No complete measure

Gloreha:
- High degree of sophistication
- Complete
- Expensive and bulky

& COMPETITION
OUR SOLUTION
NEW THERAPEUTIC TOOLS FOR THE NEURO-REEDUCATION

DEXTERITY TOOLS
- **Software**
  - Interactive testing and reporting

NORMATIVE DATA PLATFORM
- **Protocol library**

ASSESS
- Objective precision measures report
- Multicomponent dexterity profile

EXERCISE
- Targeted training
- Motivational games
- Adapted difficulty and intensity

PROGRESS
- Accurate follow-up
- Monitoring and feedback

POST STROKE REHABILITATION
- Better recovery
- Accessibility to training (more patients can train now; no possibility before for finger training)
- Telerehabilitation/home setting
**BEYOND REHABILITATION,**

**POWERFUL TOOLS FOR ASSESSMENT, PREDICTION AND PREVENTION OF NEURODEGENERATIVE DISEASES**

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**DEXTERITY TOOLS**

- Software: Interactive testing and reporting

**NORMATIVE DATA PLATFORM**

- Machine learning

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**PREDICT**

- Early detection, prognosis and prevention

**IMPROVE**

- *Faster medical* decision and care
- Train cognitive functions

**FEEDBACK**

- Monitoring disease course

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**Neurodegenerative disorders**
- Alzheimer’s disease

**Psychiatric disorders**
- Schizophrenia

**PREDICT & IMPROVE**
A MEDICAL DEVICE FROM RESEARCH

- The Dextrain method of dexterity assessment was developed in research laboratories
  - Several patents and software copyright

- A first clinical study underway to evaluate the effectiveness of the Dextrain method in rehabilitation to improve hand function after stroke

- Dextrain tools have been developed to be safe in clinical use - Medical Device and CE certification

- Its use and the relevance of its measures have been validated by several scientific publications in various pathologies (stroke, Schizophrenia, Pre-Alzheimer's, elderly)

RESEARCH COLLABORATIONS:

- **Hand dystonia**: study describing manual dexterity impairments in writer’s cramp in collaboration with Jean-Pierre Bleton (and Neurologist Sangla), Fondation Rothschild (Paris).

- **Schizophrenia**: PsyCare study evaluating neurological soft signs for prediction of psychosis development in neurodevelopmental disorders with PR Marie-Odile Krebs (GHU Sainte-Anne)

- **Alzheimer’s disease**: study on use of manual dexterity as clinical marker for early detection of mild cognitive impairment and prediction of development

- **Future collaborations**: Bilbao (MS), Stockholm (Stroke and brain injury, Pr Borg), CHU-UCL Namur (Pr Vandermeeren)
An ergonomic tool that precisely measures **force produced by each finger**

- **5 visuomotor exercises** to test key components of dexterity

- **Force control** (Finger Force Tracking)
- Learning and memorizing a **finger tapping sequence** (Sequence Finger Tracking)
- **Maximal tapping speed** (Maximal Finger Tapping)
- **Independence of finger movements** (Multi-Finger tapping)
- **Timing of finger movements** (Rhythm Tapping)
DEXTRAIN HOME CARE TABLET

SPECIFICITIES

- 6 **visuomotor exercises** to measure several key components of dexterity

- **Sensorimotor integration**
  - body scheme – mental rotation
  - (Finger recognition)

- **Timing of finger movements**
  - (Rhythm tapping)

- **Learning**
  - Short term memory
  - (Finger sequence tapping)

- **Maximal motor speed**
  - (Maximal finger tapping)

- **Independence of finger movements**
  - motor inhibition
  - (Multi-finger tapping)

- **Visuomotor Integration**
  - Visuospatial attention
  - (Line-tracking)
BENEFITS TO THE PATIENTS

PERSONALIZED REHABILITATION PROGRAM

Dexterity evaluation

Individual multi-factorial dexterity profile

Intensive exercises focused on affected aspects

Adaptive and progressive difficulty

Progress reporting across rehabilitation

Optimized training programs by continuous analysis of patients performances and professionals experiences

Optimized recovery
BENEFITS TO THE PROFESSIONALS

- **Quantification** of manual dexterity components
- First and unique method to obtain a **multifactorial dexterity profile** with only one device
- **Personalized-training** of manual dexterity
- **No other clinical tool available** for training of independent finger movements
- **Autonomous and engaging training**
- **Cognitive involvement** in exercises
KEY DIFFERENTIATORS

- **Neuroscience-inspired measures**
  Measures have been validated in scientific studies and provide clinically relevant information.

- **Dextrain possess the only technology to measure finger forces with an accuracy of 1g**
  - High temporal resolution (~20 MS)
  - Force measured in dynamic and static conditions

- **Dextrain is building the first normative database for predictive machine learning to improve dexterity assessment and early detection of psychiatric and neurodegenerative diseases**

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- **The only neuroscience-based solution for multidimensional dexterity assessment with a single tool including**:
  - Force control
  - Timing of finger movements
  - Independence of finger movements
  - Maximal speed of finger movements
  - Motor sequence learning

- **Collaborative platform** where professionals will contribute to improve the evaluations, exercises and data algorithms to obtain:
  - Optimized training protocol and rehabilitation procedures
  - Reliable prognosis and improved understanding of recovery and disease time course
OUR TEAM

LOIC POIRIER
CEO
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Archos CEO
Logic instrument CEO

PAVEL LINBERG
ADVISOR
PHD Neuroscience
Inserm

MAXIME TEREMETZ
CHIEF SCIENTIST
PHD Neuroscience
Inserm

MATHIEU BOUCHER
SENSIX
PHD Bio Engineering
Sensix CEO

ECOSYTHEME
10 YEARS
OF RESEARCH PROVE DEXTRAIN TO BE AN EFFECTIVE PREDICTION AND REHABILITATION PROTOCOL

RESEARCH COLLABORATIONS

Stroke: study evaluating efficacy of Dextrain training to improve hand function after stroke in collaboration with following hospitals: PR Jean-Louis Mas, GHU Sainte-Anne (Paris), PR Charlotte Rosso, CHU Salpêtrière (Paris), Dr Florence Colle, Saint-Maurice (Paris).


Schizophrenia: PsyCare study evaluating neurological soft signs for prediction of psychosis development in neurodevelopmental disorders with PR Marie-Odile Krebs (GHU Sainte-Anne).

Alzheimer's disease: study on use of manual dexterity as clinical marker for early detection of mild cognitive impairment and prediction of development.

Future collaborations: Bilbao (MS), Stockholm (Stroke and brain injury), CHU-UCL Namur (PR Vandermeeren).

PUBLICATIONS


