kintroom

WHEN HEALTHCARE MEETS AI

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## Introduction

At VMobile we develop Artificial Intelligence (AI) based solutions for retail, sales force automation, smart cities, production, transport, infrastructure and resource planning, environment, healthcare, marketing and advertising, automotive, tourism and recreation.

Our goal is to create a solution to improve healthcare and facilitate access to it through artificial intelligence algorithms.

## Mission

Optimize the cost and results of medical services. A solution can always be found that generates real savings while preserving the quality of service. We believe that access to fast and quality medical services is a key value. Modern technologies give us the freedom and flexibility to achieve results faster and more effectively.

**Kintroom** enables people around the world to access treatment and track the outcome of such, regardless of their geographical location.

One goal of our approach is to recognize healthy and impaired motion solely based on unprocessed video frames.

## Executive Summary

Motor behavior analysis is essential to biomedical research and clinical diagnostics as it provides a non-invasive strategy for identifying motor impairment and its change. Moreover, the objective quantification of motor impairment in patients is not only valuable to detect and classify distinct functional deficits, it can also serve as basis for individually optimized treatment strategies.

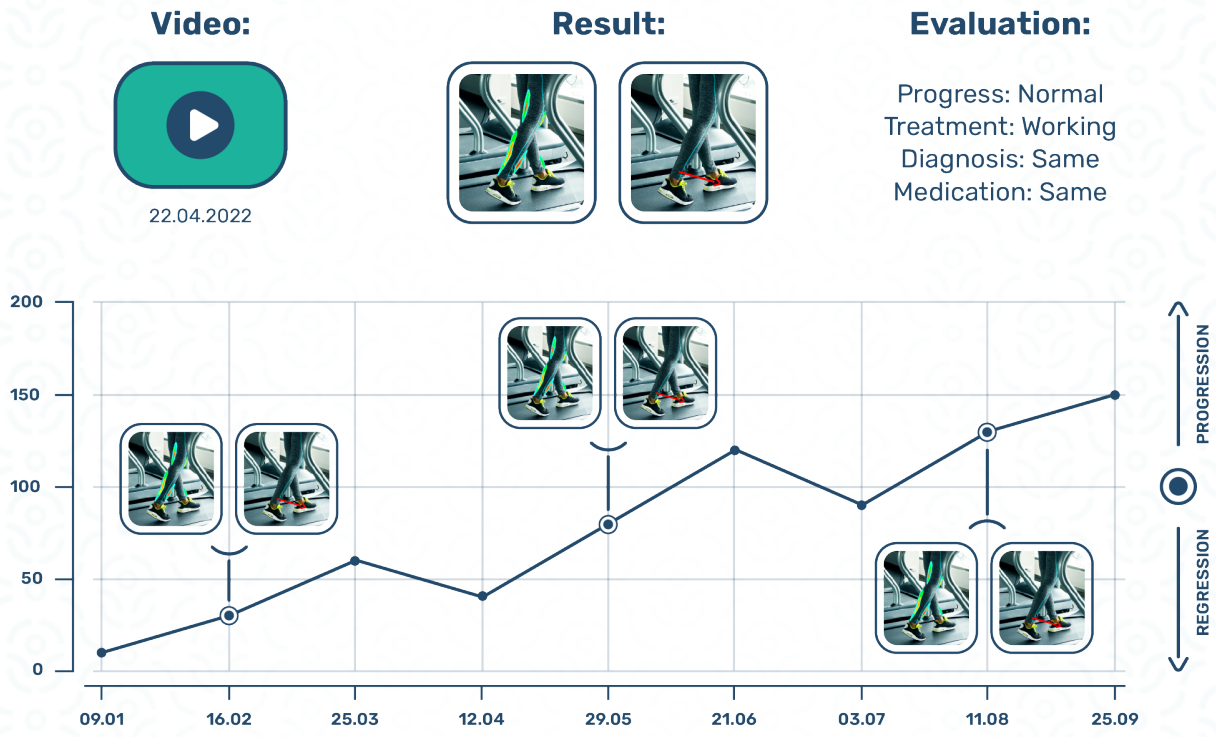
Videos of behavior recorded during the long-term recovery after neurological diseases provide an easily available, rich source of information to evaluate and adjust drug application and rehabilitative treatment paradigms.

The main bottleneck in behavioral studies is presently that all analysis of skilled motor function depends on a time-intensive, potentially subjective, and costly manual evaluation. Behavior analysis has so far mainly relied on reflective physical markers placed on body joints. Motion analysis is a tool for assessment of Neurological functions designed to benefit scientists interested in investigating neurological function. Provide the opportunity through innovative methods for clinical observations without visiting the clinics.

With the **Kintroom** solution specialists will be able to quickly and easily review test results, as well as to review history of previous tests.

- Review previous diagrams and videos
- Understand the difference
- Perform before and after analyses
- Enables consultations between highly qualified medical professionals and patients from any location.

The **Kintroom** application could develop an advanced functionality that allows multiple analysis based on detection and tracing of points from the human body.



## User Story

### Patients

As a patient with a neurological illness, I need a solution that:

- Provides an adequate diagnosis
- Enables me to track my illness
- Gives me access to an adequate treatment
- Tracks an easy progression of the treatment result
- Enables an easy and quick response from my doctor
- If necessary, can easily get me a second opinion
- Saves me time
- Gives me access to expertise regardless of my geographical location
- Has an easy to operate system
- Has an easy to use application

### Doctors

As a doctor and scientist, I need:

- An easy for use solution
- A way to help my patients from a distance
- To review the history of their disease
- Access to the experience of colleagues, regardless of their geographical location

### Pharmaceutical companies

As an innovative company that develops new drugs, we need:

- To simplify the process of testing and introducing our new products
- Access to a large patient-doctor ecosystem, regardless of their geographical location
- Accelerated tracking of test results

This will allow us to redirect the cost of lengthy and time-consuming tests to our research.

## The Technology

### Mobile App

The **Kintroom** application is available for android and iOS smartphones. It provides the following base functionality for the patients:

- Patient profile
- Receiving daily, monthly or annual program with needed pre-set
- Capture video according pre-predefined criteria
- Access to their own patient profile and history with results of the tests
- Preview the past tests
- Receiving treatment recommendations from the doctor

### Web Platform

The web platform is the place where doctors meet with their patients. The web platform of **Kintroom** has two type of users - **Doctors** and **Patients**. The platform provides the same functionality as a mobile application and adding additional one for the Doctor's needs:

Each doctor has his own room with his patients and their files. The doctors can browse the profiles of the patients, check the results of tests, preview test videos, change the prescribed therapy, setting up a program with the necessary tests, send massages to the patients.

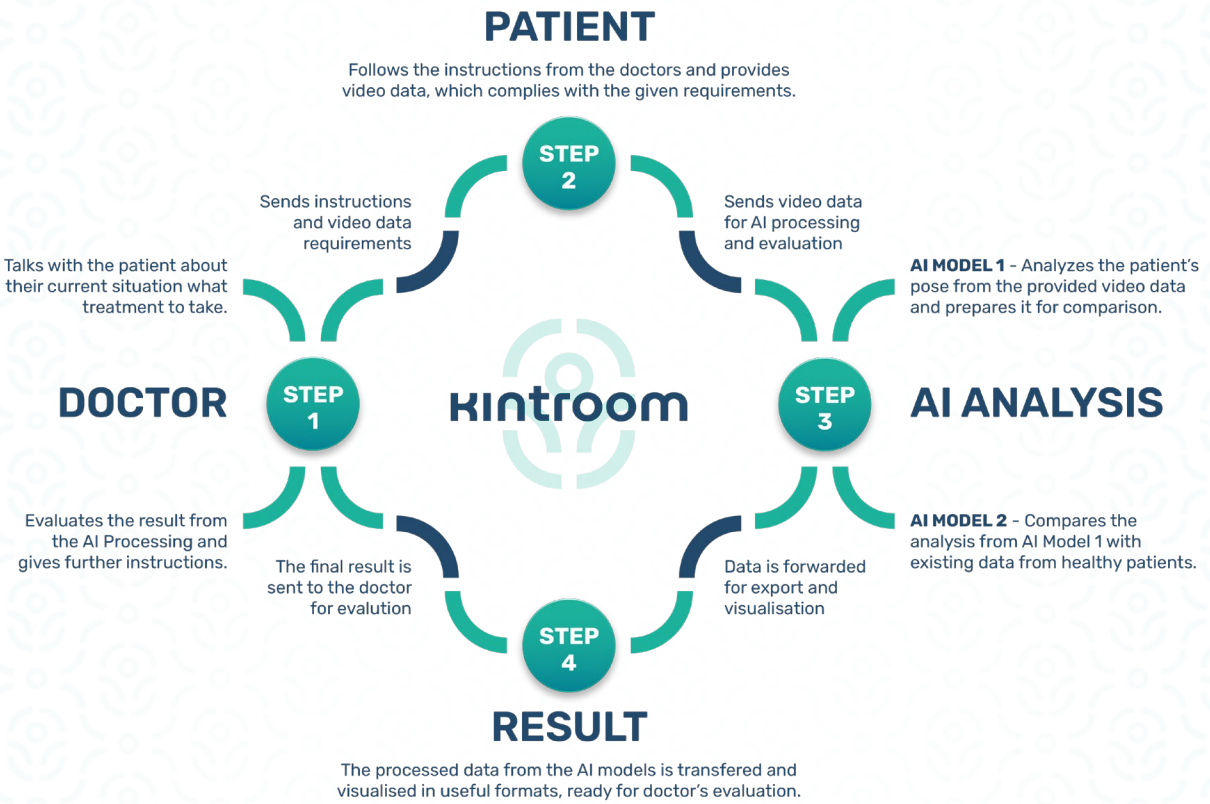
### AI Model

We develop custom AI models for the needs of the specific cases. Each AI model is developed with in-depth discussions, analyzes and consultations from scientists with proven experience in their field and AI experts. The purpose of the models is to analyze the video tests performed, to compare the results of previous tests and to evaluate progress or regress.

Using our generative model, we can amplify the behavioral difference between healthy and query subjects to facilitate the diagnosis.

We propose a fully automatic, unsupervised diagnostic support system for behavior analysis that can discover even subtle deviations of motor function. The approach not only extracts and classifies behavior, but it can also compare and quantify even small differences.

With this approach we can automatically compare the captured behavior against reference videos showing healthy or impaired behavior of other individuals, since it is invariant to inter-subject variations in appearance. Also, behavior can be contrasted against previous videos of the same individual during a recovery process to identify the fine differences.




## The Healthcare

Neurological disorders are medically defined as disorders that affect the brain as well as the nerves found throughout the human body and the spinal cord. Structural, biochemical or electrical abnormalities in the brain, spinal cord or other nerves can result in a range of symptoms like motor behavior.

We believe that by introducing modern technology and artificial intelligence in the diagnosis and tracking of neurological diseases that impair motor behavior, we can significantly improve the lifestyle of patients' suffering from such diseases.

Some of these diagnoses are:

- Cerebral palsy.
- Muscular dystrophy.
- Multiple sclerosis.
- Spina bifida.
- ALS (Lou Gehrig's Disease)
- Arthritis.
- Parkinson's disease.
- Essential tremor.

## Use Case

### Diagnosis prediction

By shooting a video or series of videos, **Kintroom** can direct the doctor to a diagnosis that he can confirm or reject. The video can be shot from anywhere in the world without the need to visit a clinic or hospital.

Each new patient examination, with a diagnosis confirmed or rejected by the doctor, contributes to the development and improvement of **Kintroom** in its proposal of the correct diagnosis.

The main advantages from the use of **Kintroom** in this case are:

- No needs to travel
- Time saving for the patients
- Time saving for the doctors
- Better and fast diagnoses
- Providing the opportunity to serve more patients
- Possibility for a second opinion

### Result of therapy (Clinical trials)

By shooting a video or series of videos during treatment, **Kintroom** can indicate and mark the changes and suggest the direction of development of the treatment. The video can be shot from anywhere in the world without the need to visit a clinic or hospital.

In this case, the therapy results can be used to more quickly collect data from a large group of patients for the introduction of new drugs or to properly manage the treatment of a patient.

The main advantages from the use of **Kintroom** in this case are:

- Rapid collection of results from a large number of patients.
- Faster testing of new drugs
- Time saving for the patients.
- Time saving for the doctors.
- Cost saving for the pharmaceutical companies

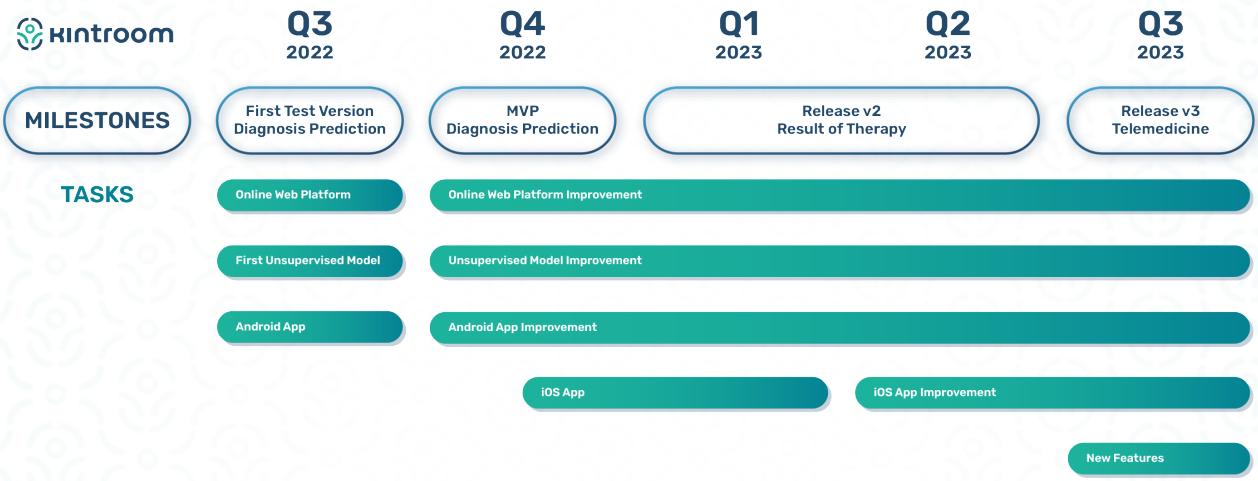
## Business Model

The **Kintroom** solution will be provided for free for all consumers except the pharmaceutical companies that conduct clinical trials of new drugs.

The revenue model is based on collecting fees for each new clinical trial.

Every clinical trial needs specific settings of the models and the solution, this is the reason why the main funding will come from Pharmaceutical companies.


## Roadmap




## Privacy

At **Kintroom** we seriously observe legal compliance. We stick to the rules of Data Protection Regulations of US and EU for collecting, anonymizing, aggregating, encrypting and storing location data, health condition and treatment to protect personal information. We analyze strictly the impact of **Kintroom** on the rights and interests of all data subjects and take adequate measures with up-to-date and high-level technological solutions.