



GRAVITAB

SENSOMOTORIC EXPERIENCE

We wanted to make mental and physical abilities measurable and long-term traceable to a limited extent using traditional testing tools. How can we perform effective and accurate aptitude testing, mental health assessment in people, even in their homes, without the stressful situation associated with clinical trials? Instead of a traditional diagnostic tool, we aimed to create an interactive game. The process of play, as a spontaneous, self-forgetful activity, provides an excellent opportunity to examine concentration, sensorimotor abilities, and other hard-to-measure areas. It was important that the tool be applicable to people of all ages and abilities.

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HUNGARIAN
GOVERNMENT

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Development Fund

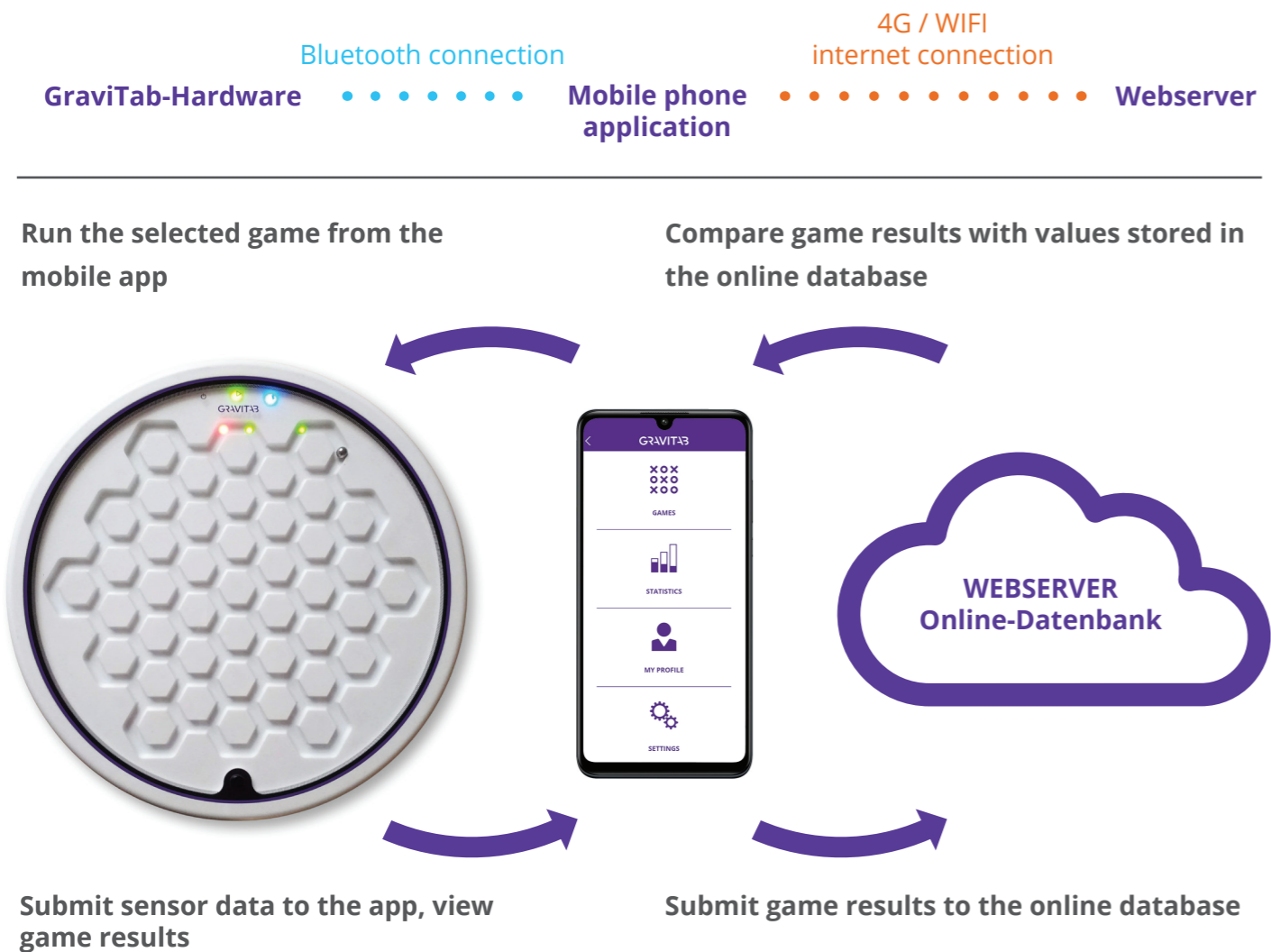


INVESTING IN YOUR FUTURE

HOW IT WORKS?

The hardware part of the GraviTab game is a 40-centimeter-diameter, circular, hand-held skill game in which the user tilts a metal ball in a track system according to the selected task type by tilting the board. An LED was placed in each node of the hexagonal grid-shaped path system to illuminate the selected task in red, green, and orange. For example, in "Collect and Avoid in Game", the goal is to "collect" all the points that light up in green bypassing the nodes that light up in red. In addition to the multicolor LEDs, an induction coil was placed in the nodes to sense the passage of the metal ball. Passes through the node are timestamped in the web server database, so the entire process of the game being played can be reproduced later, which is the basis of the evaluation process.

Gravitab as a physical device was treated as a hardware peripheral at the start of development hours. The fewer logic we wanted to embed in the device itself, we installed the entire program logic in the mobile application and the server-side application for easier development. On a hardware device connected via Bluetooth, similarly to an interactive screen, we only wanted to display the task issued by the mobile application, as well as detect the user's movement, the progress of the task solution with sensors, and send the sensor data to the mobile application.



GAME RESULTS

Statistics

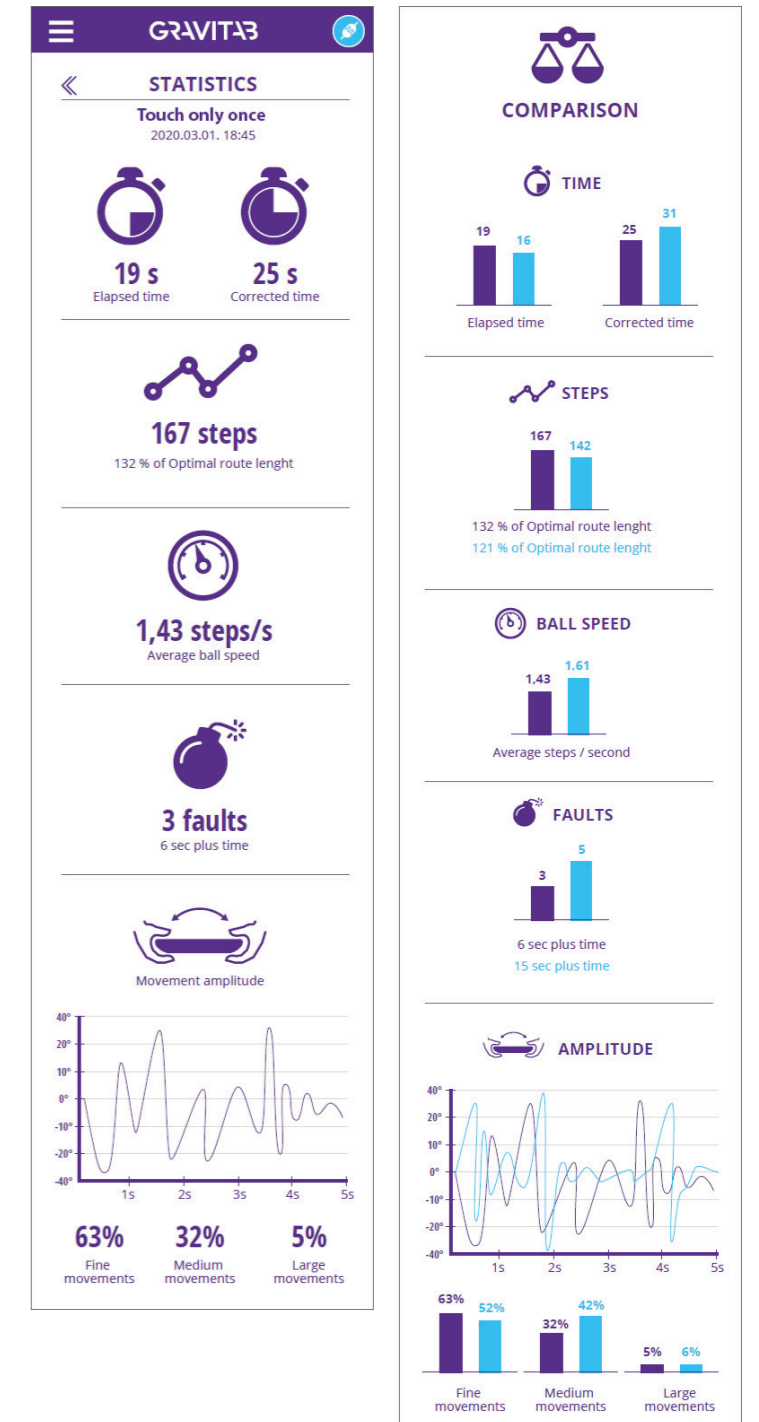
After the game is over, you can see a quick statistic of the results, which includes:

- Game time, error time corrected game time
- Number of steps (passing through a node with the ball), its ratio to the minimum number of steps
- Average ball speed
- Number of errors
- Amplitude of the tilt of the board - plotted on a graph, percentage of fine, medium and large movements

The application transmits all information related to the games to the database of the web server assigned to the given user, which can be used for comparative tests and analyzes later.

Comparison

To compare a user's game results, the Comparison feature must be selected in the application, where the user can compare their performance with their own previous game results or the results of their reference group. By reference group we mean people of the same age, gender and health status as the user.



FIELDS OF APPLICATION

The ability to play and play ideally accompanies a person throughout his life. In the case of children, it is an important element of mental and physical development, in adulthood it provides the opportunity for active recreation and regeneration. It helps to preserve the mental state in old age.

The GraviTab sensor motor development game and diagnostic tool combines the benefits of in-depth manual action with a multi-user digital world. Part of the GraviTab hardware is a real, tangible game of skill in which the user tilts a metal ball in a track system according to the type of task selected by tilting the board. Issuing tasks and completing the game is already done by a smartphone app. This allows for measurability in the skill development game, a comparison of the user's performance in the same task type with their previous performance and their peers playing with GraviTab. The GraviTab tool is also excellent for suitability tests, with targeted task types appropriate to the field.

ANALYSIS OF CHILD DEVELOPMENT



TEST OF SUITABILITY FOR WORK



SENIOR CARE



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