



PELE UPDATE NOVEMBER 2020

The PELE track of ALYN Hospital's Innovation Space, made up of professional staff and volunteer "makers," provides case-driven, personalized, affordable solutions for children of all backgrounds and from all parts of Israel who face physical challenges to independence in their day-to-day activities – such as eating, dressing, maintaining personal hygiene, communicating, studying and being mobile.

Since the beginning of 2020 alone, the staff of PELE have received more than 154 requests for solutions to help children with disabilities to be more independent in their daily lives and to be able to participate in more significant ways in educational and social activities, with nearly half of these requests already having been fulfilled!

In addition to the development of solutions to the challenges that the children with disabilities and their families face, a range of community outreach activities took place as well. The following list includes just a few examples:

- PELE Director Hilla Boral was interviewed on Israeli radio,
- an article about PELE was published in the International Society for Virtual Rehabilitation Newsletter,
- an agreement with the Holon Institute of Technology's BA program in Digital Technology in Medicine was signed,
- a promotional video to help explain PELE's services to families and health professionals was created.

All of this has been accomplished by the committed staff of PELE since January, ***despite the restrictions imposed by the Ministry of Health starting in March to protect against the spread of COVID-19***, including:

- the closure of PELE's physical facilities for several weeks,
- the limiting of some volunteers (many of whom are retired) from returning to their work at PELE even after the facilities were re-opened,
- the delay of some projects that were being developed in collaboration with volunteers from companies, government agencies or academic institutions due to official closures or work-from-home orders,
- the limited availability of some supplies due to the COVID-19 lockdown.

PELE SOLUTIONS IN RESPONSE TO THE COVID-19 PANDEMIC

At the beginning of the COVID-19 pandemic, when personal protective gear (PPE) was in high demand and the consequences of infection for people on chronic ventilation were unknown, the staff of PELE developed a number of products made from common household items in order to help protect, and even, save lives:

- face mask with transparent area over mouth for speech therapists in treating hearing impaired children
- a low-tech personal "tent" to prevent the spread of the virus into the air through a ventilator,
- protective robes for the ALYN staff (used temporarily until a supply of robes could be acquired),
- an instructional video for making Do-It-Yourself (DIY) protective visors that people could make at home.

MORE THAN 550 SOLUTIONS DEVELOPED IN PELE SINCE THE CREATION OF THE INNOVATION SPACE IN MID-2017 NOW BENEFITING CHILDREN WITH DISABILITIES!

More than 550 solutions have already been *fully developed* by the PELE staff and volunteers and *are in use* by children and therapists across Israel. Over 140 additional solutions are currently in progress. Many of these solutions have been developed in cooperation with top high-tech companies, academic institutions and defense-related organizations in Israel, including:

- Bezalel Academy of Art and Design
- Hebrew University of Jerusalem Israel
- HILMA – Tech for Impact
- IDF Tank Development Unit
- Microsoft
- Talpiot
- Tel Aviv University
- HIT – Holon Institute of Technology
- Intel
- Medtronic
- Orcam
- Rafael Advanced Defense Systems
- Stratasys
- Tom – Tikkun Olam Makers

FASHION MINI-PELETHON FOR CHILDREN WITH SPECIAL NEEDS

In late December, PELE invited volunteer “makers,” including professional clothing designers, talented sewing amateurs, and hair stylists from the community, to join with ALYN Hospital experts in clothing and dressing for children with special needs (occupational therapists) to solve clothing design challenges for 6 children with complex physical challenges. This unique “Fashion Mini-PELEthon” caught the attention of the Israeli press (Ynet).

At the end of the Fashion PELEthon, a photo shoot took place with each team, the children, their family member and, of course, their new clothing. The PELE volunteer photographer also made a video documenting the event, which can be viewed at: <https://www.youtube.com/watch?v=DwDLwvoezco>



ADAPTED MUSICAL INSTRUMENTS FOR USE IN THE INCLUSIVE CHILDREN'S ORCHESTRA

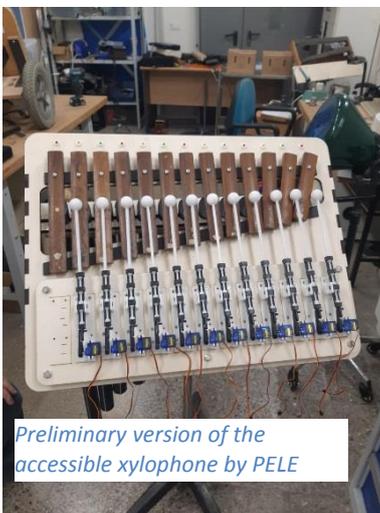
During the 2019-2020 school year, a group of children with special needs in ALYN Hospital's SHACHAR school participated in a year-long inclusive music program with children from the community. This inclusive music program was a continuation of the same program that had taken place the previous year, but this time the SHACHAR music therapist and music teacher turned to PELE to adapt musical instruments to the needs of the children, enabling not only more children to participate, but also for their participation to be more significant.

In all, 10 children received adaptations to musical instruments of their choosing, including:

- Accessible Mallets for Percussion Instruments
- Adaptable Stands for Percussion Instruments
- Accessible Plectra (Picks) for String Instruments

The 10 special children from ALYN Hospital's SHACHAR school practiced and rehearsed both alone and alongside the children from the community in preparation for their end-of-year performance, which was to take place this past June. However, due to the COVID-19 pandemic and the strict regulations regarding gatherings, the performance had to be taken to the "virtual stage." The music teacher, music therapist and PELE staff went to the homes of the SHACHAR children with a small film crew to record each child playing in his or her home, and also recorded the children from the community playing and singing at ALYN Hospital.

The children felt honored to have the "music video" commemorating their hard work throughout the year shown during a virtual end-of-year celebration on Zoom. Their teachers and the PELE staff – but most significantly, the children's parents – were especially proud of their achievements. The full music video can be viewed at: <https://youtu.be/sjMf79-mCNY>



Preliminary version of the accessible xylophone by PELE

One of PELE's goals for 2021 is to not only adapt musical instruments, as they have been doing until now, but also to **create accessible musical instruments** for children with disabilities so that they can participate in the Inclusive Orchestra and play to their hearts' content!

Some instruments being considered are:

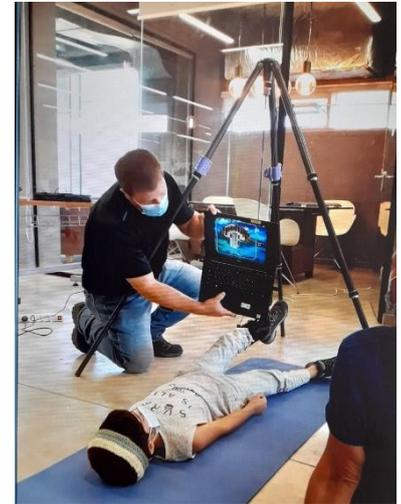
- Accessible xylophone that can be controlled with a switch connected to mallets and allow the child to strike the bars.
- Accessible harp with plectra held by a "robot" that is controlled by the child with a sensitive switch.
- Apps on a tablet that would allow for controlling the musical instruments.

PORTABLE PERTHES DISEASE POST-SURGERY HIP JOINT EXERCISER WITH VIDEO GAMES

Children with Perthes disease, a disease that affects the hip joint and requires surgery followed by intensive, continuous physiotherapy, need motivation to continue to exercise their hip joint on a regular basis outside of the designated physiotherapy sessions. PELE's solution includes three components:

- 1) a tripod
- 2) a tablet computer loaded with video games
- 3) a leg sling that hangs from the tripod; used in place of the tablet's mouse

The child lays underneath the tripod and places his lower leg into the sling. He can then play the video game on the tablet by moving his leg – from the hip joint – in various directions. The portable solution can be used almost anywhere, and the tablet logs the data about the exercises so that the physiotherapist can evaluate the quantity and quality of the child's movements.



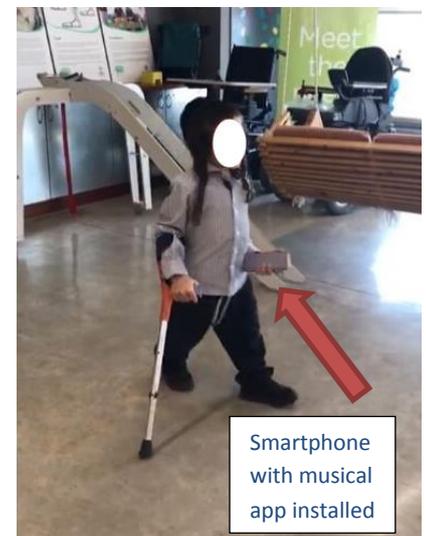
LOW FLOW CUP COVER FOR BABIES DIAGNOSED WITH FAILURE TO THRIVE

Some premature babies are diagnosed with "Failure to Thrive" due to the inability to suck on a bottle, and face being put onto a feeding tube for their nutrition. The PELE staff and volunteers developed a 3-D printed cover for a baby drinking cup with an opening just big enough to allow a low flow of baby formula to be released into the baby's mouth. Beyond the nutritional benefits, the baby also experiences the bonding of being held by her mother or father while being fed.



MUSICAL APP TO ENCOURAGE CHILDREN TO EXERCISE USING THEIR WALKER

For children for whom exercising using crutches or a walker is painful, scary or plain boring, PELE created an app for a smartphone that plays music of the child's choosing as long as the child continues walking – the moment the child stops walking, the music also stops. The app uses the phone's GPS system to detect actual walking, rather than just movement, and the phone can be held in the hand of the child or attached to the walker or crutches using a holder.



HIGHLIGHTING SOME OF THE 100+ PROJECTS NOW IN THE WORKS

- **Mechanical game of "memory" or "snakes & ladders" controlled by an eye-tracking system so that a child who is paralyzed can play with other children**
- Pool slide for children who use wheelchairs
- Collar to prevent the pulling out of the canula by a toddler
- **Arm that can hold a lollipop (or other small food item) that is controlled by a light switch, allowing a child with little muscle control to independently bring the lollipop to her mouth to lick it**
- 360 degree camera for a child who is paralyzed to be able to see all around her through a tablet
- Jolly Jumper, usually used by babies for jumping, for small children who have very weak leg muscles
- **Colorful, musical hand sanitation device to encourage children to sanitize their hands**
- Mechanism to prevent teen who uses a powered wheelchair from falling onto the sidewalk
- Glove to maintain an angle between the hand and the wrist so that children with CP can maintain their grip on bike handlebars
- Adjustable height obstacle for use in ALYN's hydrotherapy pool
- **Custom-made silicone compression therapy face mask for scarring from burns (to be presented at the Holon Museum of Design in December)**

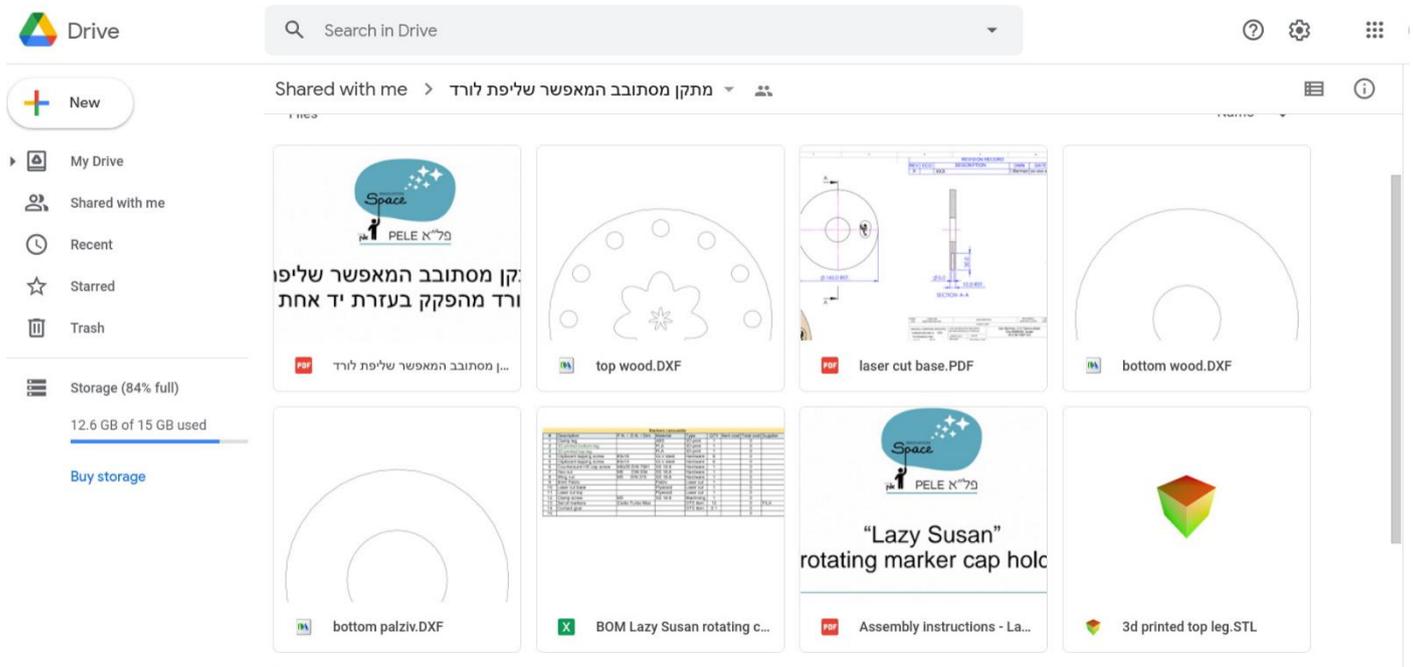


OPEN-SOURCE GLOBAL PLATFORM AND ASSISTIVE TECHNOLOGY PRODUCT FILMS

Besides the existing features on the PELE website, which went live in its initial stage earlier this year offering parents and therapists information about the PELE's services as well as a downloadable PDF product catalogue - **with full English and Arabic translations** – the website has had a number of significant additions.

Open-source manuals

The open-source manuals include design and technical specifications for making reproductions of some of the most requested solutions developed by the PELE staff, with the ability to make adjustments according to the need of the child. The manual is available as a package of files on Google Drive and includes assembly instructions, .stl files for 3D printing, .ino files for electronics prototyping, a detailed list of required components, and sketches.



Example of open-source manual for PELE solution

Do-It-Yourself (DIY) videos

For the less technically-inclined, the DIY section has video instructions for making more simple solutions using common household items.

More solutions with their open-source manuals and DIY videos are currently being prepared and are envisaged to be uploaded to the website by the end of this year. The PELE website, which is currently in Hebrew and is in the process of being translated to English and Arabic, can be found at: www.alynpele.org.