Listening

1. FELADATSOR

Part 1 Physical Therapy Is Boring

Track 3

When I was growing up, I really liked playing hide-and-seek a lot. One time, though, I thought climbing a tree would lead to a great hiding spot, but I fell and broke my arm. I actually started first grade with a big cast all over my torso. It was taken off six weeks later, but even then, I couldn't extend my elbow, and I had to do physical therapy to flex and extend it, 100 times per day, seven days per week. I barely did it, because I found it boring and painful, and as a result, it took me another six weeks to get better.

Many years later, my mom developed frozen shoulder, which leads to pain and stiffness in the shoulder. The person I believed for half of my life to have superpowers suddenly needed help to get dressed or to cut food. She went each week to physical therapy, but just like me, she barely followed the home treatment, and it took her over five months to feel better.

Both my mom and I required physical therapy, a process of doing a suite of repetitive exercises in order to regain the range of movement lost due to an accident or injury. At first, a physical therapist works with patients, but then it's up to the patients to do their exercises at home. But patients find physical therapy boring, frustrating, confusing and lengthy before seeing results. Sadly, patient noncompliance can be as high as 70 percent. This means the majority of patients don't do their exercises and therefore take a lot longer to get better. All physical therapists agree that special exercises reduce the time needed for recovery, but patients lack the motivation to do them.

So together with three friends, all of us software geeks, we asked ourselves, wouldn't it be interesting if patients could play their way to recovery? We started building a MIRA, a P.C. software platform that uses this Kinect device, a motion capture camera, to transform traditional exercises into video games.

When designing a game, we speak to physical therapists at first to understand what movement patients need to do. We then make that a video game to give patients simple, motivating objectives to follow. But the software is very customizable, and physical therapists can also create their own exercises. Using the software, my physical therapist recorded herself performing a shoulder abduction, which is one of the movements my mom had to do when she had frozen shoulder. I can follow my therapist's example on the left side of the screen, while on the right, I see myself doing the recommended movement. I feel more engaged and confident, as I'm exercising alongside my therapist with the exercises my therapist thinks are the best for me. This basically extends the application for physical therapists to create whatever exercises they think are best.

The auction house game is designed to prevent falls, strengthen muscles and improve balance. In two days, my grandmother will be 82 years old, and there's a 50 percent chance for people over 80 to fall at least once per year, which could lead to a broken hip or even worse. Poor muscle tone and impaired balance are the number one cause of falls, so reversing these problems through targeted exercise will help keep older people like my grandmother safer and independent for longer. When my schedule ends, MIRA briefly shows me how I progressed throughout my session.

I have just shown you three different games for kids, adults and seniors. They can be used with orthopedic or neurologic patients, but we'll soon have options for children with autism, mental health or speech therapy. My physical therapist can go back to my profile and see the data gathered during my sessions. She can see how much I moved, how many points I scored, with what speed I moved my joints, and so on. My physical therapist can use all of this to adapt my treatment.

I'm so pleased this version is now in use in over 10 clinics across Europe and the U.S., and we're working on the home version. We want to enable physical therapists to prescribe this digital treatment and help patients play their way to recovery at home. If my mom or I had a tool like this when we needed physical therapy, then we would have been more successful following the treatment, and perhaps gotten better a lot sooner.

Part 2 Tiny Forests

Track 5

I'm an industrial engineer. The goal in my life has always been to make more and more products in the least amount of time and resources. While working at Toyota, all I knew was how to make cars until I met Dr. Akira Miyawaki, who came to our factory to make a forest in it in order to make it carbon-neutral. I was so fascinated that I decided to learn this methodology by joining his team as a volunteer. Soon, I started making a forest in the backyard of my own house, and this is how it looks after three years.

These forests, compared to a conventional plantation, grow tenfold faster, they're 30 times more dense, and 100 times more biodiverse. Within two years of having this forest in our backyard, I could observe that the groundwater didn't dry during summers, the number of bird species I spotted in this area doubled. Quality of air became better, and we started harvesting seasonal fruits growing effortlessly right in the backyard of our house.

I wanted to make more of these forests. I was so moved by these results that I wanted to make these forests with the same acumen with which we make cars or write software or do any mainstream business, so I founded a company which is an end-to-end service provider to create these native natural forests. But to make afforestation as a mainstream business or an industry, we had to standardize the process of forest-making. So we adapted the Toyota Production System known for its quality and efficiency for the process of forest-making.

For an example, the core of TPS, Toyota Production System, lies in heijunka, which is making manufacturing of different models of cars on a single assembly line. We replaced these cars with trees, using which now we can make multi-layered forests. These forests utilize 100 percent vertical space. They are so dense that one can't even walk into them. For an example, we can make a 300-tree forest in an area as small as the parking spaces of six cars. In order to reduce cost and our own carbon footprint, we started utilizing local biomass as soil amender and fertilizers. For example, coconut shells crushed in a machine mixed with rice straw, and powder of rice husk mixed with organic manure are finally dumped in the soil on which our forest is planted. Once planted, we use grass or rice straw to cover the soil so that all the water which goes into irrigation doesn't get evaporated back into the atmosphere. And using these simple improvisations, today we can make a forest for a cost as low as the cost of an iPhone.

Today, we are making forests in houses, in schools, even in factories with the corporates. But that's not enough. There are a huge number of people who want to take matters into their own hands. So we let it happen. Today, we are working on an Internet-based platform where we are going to share our methodology on an open source using which anyone and everyone can make their own forest without our physical presence being there, using our methodology. At the click of a button, they can get to know all the native species of their place. By installing a small hardware probe on site, we can do remote soil testing, using which we can give step-by-step instructions on forest-making remotely. Also we can monitor the growth of this forest without being on site.

This methodology, I believe, has a potential. By sharing, we can actually bring back our native forests. Then, when you go back home, if you see a barren piece of land, do remember that it can be a potential forest.

2. FELADATSOR

Part 1 The Jobs We'll Lose To Machines — And The Ones We Won't

Track 7

In 2013, researchers at Oxford University did a study on the future of work. They concluded that almost one in every two jobs has a high risk of being automated by machines. Machine learning is the technology that's responsible for most of this disruption. It's the most powerful branch of artificial intelligence. It allows machines to learn from data and mimic some of the things that humans can do. My company, Kaggle, operates on the cutting edge of machine learning. We bring together hundreds of thousands of experts to solve important problems for industry and academia. This gives us a unique perspective on what machines can do, what they can't do and what jobs they might automate or threaten.

Machine learning started making its way into industry in the early '90s. It started with relatively simple tasks. It started with things like assessing credit risk from loan applications, sorting the mail by reading handwritten characters from zip codes. Over the past few years, we have made dramatic breakthroughs. Machine learning is now capable of far, far more complex tasks. In 2012, Kaggle challenged its community to build an algorithm that