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Big data and computer graphics will offer remote relief

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Imagine you wake up one morning and -- just like it happens to so many other people every day everywhere -- something in your body is not working the way it worked just the night before: your lower back (very common), your knee, your elbow, or many other possible parts of your body ache and cannot function the way they previously did. After the typical doctor appointment, MRI scan, specialist consultation, and the like, you are prescribed Physical Therapy (PT). Only problem is that your work and life schedule, and your geographic location make it impossible for you to attend any PT center. Or, you are a soldier in some far away field, suffering something similar, with no possible PT specialist within hundreds or thousands of miles. You are, however, luckier. The following day, a special delivery drops at your location a package. In it is a cuff, like the ones you have seen many athletes put on a tender knee or elbow. Almost, this one has an array of hundreds of sensors. You slip it on that aching knee, bluetooth connect it to your phone and start the sets of exercises prescribed to you. As you start your exercises, someone comes on the line, correcting your movements, guiding you to the right exercise routine. She is your remote Physical Therapist. She can be located half way around the world, but your "smart" cuff gives her a live viewing how you are doing your exercises. But not just that, it also gives her indicator measurements that tell her how your motion ability is compared to a person that is similar to you in age, gender, body build, and many other measurements, but who do not suffer from any injury. Further, the camera that came in the package with the cuff is aimed at your face. It collects your facial expressions and analyses them to assess the level of pain you might experience as you are going through your exercises. Based on all those indicators, your PT might guide you towards different exercises, or just to increase or reduce how strenuous those exercises should be and much more. No, this is not a science fiction movie. In this talk I will describe how with the help of big data and the latest machine learning technologies we are able to analyse your PT exercise data, and how computer graphics and visualization techniques provide your PT trainer a live viewing of what you are actually performing and how you are performing it.

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