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15.310 Memo: Artificial intelligence, machine learning, business:

One quote from the TED talk that particularly struck me: “what was otherwise a task for 40 people over three months became a simple job for three people in 40 hours.” It’s brilliant that we are growing in our capability to mesh human “non-linear approaches, creativity, iterative hypotheses” and overall advantages of big data processing power and detailed analysis of the computer.

This reminded me of a recent topic covered in my Algorithms class: dynamic programming. Although the name is misleading, it came about from the desire of its developer, Dr. Bellman, to disguise its mathematic nature and to deflect scrutiny from the then Secretary of Defense, Mr. Wilson. In Bellman’s words,

“[Wilson] actually had a pathological fear and hatred of the word research. […] You can imagine how he felt, then, about the term mathematical. […] I felt I had to do something to shield Wilson and the Air Force from the fact that I was really doing mathematics inside the RAND Corporation. […] I decided therefore to use the word “programming”. I wanted to get across the idea that this was dynamic, this was multistage, this was time-varying I thought, let’s kill two birds with one stone. Let’s take a word that has an absolutely precise meaning, namely dynamic, in the classical physical sense. It also has a very interesting property as an adjective, and that is it's impossible to use the word dynamic in a pejorative sense. Try thinking of some combination that will possibly give it a pejorative meaning. It's impossible. Thus, I thought dynamic programming was a good name. It was something not even a Congressman could object to. So, I used it as an umbrella for my activities.”

The humorous history of the name dynamic programming came to mind when I read about the efforts of the government to map the Haitian floodplains. Although it may not have been relevant in this case, it was amusing to be reminded of the visible effect government structure and bureaucracy has on the development of new technologies. Dynamic programing also comes to mind because it is essentially an efficient way of taking a large, complicated problem with dependencies on many other problems and using smart organization and computer processing power and memory access to past problems to explore every possible sub problem, all faster than even a very clever human could. Dynamic programming leverages the computer’s ability to run many outcomes to build to the original problem, just as the chess players and Haitian relief workers were able to use various forms of AI to do.

It’s pretty incredible what the combination of human and computer strengths are able to do in conjunction. After watching a lot of House, M.D this break, I also started to think about the immense advantage of computer technologies in surgery, patient monitoring, and abnormality identification. No case of whatever disease is the same, but just like computer programs, doctors use specific parameters and knowledge of their own past experience and that of other doctors and research they’ve read about to make their diagnoses. It’s extremely valuable to be able to train computers and use developments in AI and machine learning to build the ability of computers to

complement human physicians as they work to identify symptoms and causes, to categorize and treat patients.

Computers can be made masters of precision, so with the right partnership of doctor and machine, more regulated, targeted, and well-recorded care can take place, building the path towards a greater and better integrated medical record across many medical institutions.

As with everything, this comes with risk of over sharing, of hacks and possible exposure of confidential patient data (looking at you, Uber). However, overall, tech and business have incredible potential to mix and mix well, and are most certainly compose the future of where the industries are headed.