A new era of infinite computing in health care

Dan Connors, Ph.D

Editor's note: To hear more about the power of computing in analytics, [listen to a free podcast here](http://example.com).

Google Analytics, Microsoft Azure, Amazon’s Elastic Map and Reduce – these systems now enable entities to act very nimbly to do research and run analytics on data without a lot of overhead. Right now it’s less expensive to use a thousand computers in a single day then to run one computer for a thousand days. And this model is starting to shift many paradigms, especially in research.

Essentially, it’s infinite capacity.

This type of computing power underscores a dramatic breakthrough in different algorithms. There are a multitude of calculations that you can solve related to predictive models. Can we, for example, perform a thousand analyses in one day for a patient rather than have that patient come in for an annual check-up and actually have a greater impact?

The infinite computing power available to us today makes it possible to take a new approach to healthcare analytics: To advance from data to knowledge and then into action. The ability to extract knowledge from large amounts of data – from many different repositories – is what researchers need to enable this model of predictive medicine.

Smart health means using my data for a healthier me

Our first step is to understand which patients are similar. This can be really straightforward with the computing power we have available today. Machine-learning tools help us build a simple model to classify distinct groups of patients.

If we can run analyses on these patients, even when they’re not in the room, we can find similar candidates with measurements and lab scores we can relate to our current patient. This gives us the foundation upon which to build predictive models to help systems recognize what information needs detection.

To connect the dots, we also need human engagement in this process; there are problems that we are better at solving than computers. Think about CAPTCHA. Anytime you lose a password you are asked to solve a CAPTCHA. And over the past ten years these have gotten more difficult to solve. No longer are they just visual, sometimes they are actually cognitive, requiring human intelligence to complete. In the same way, building predictive models requires collaboration and detail, so we’re not just throwing data into a machine.

At Allscripts Analytics we’re comparing patients and their features. Within the Allscripts Data Lake we have access to millions of patient records, which we’ve been able to analyze in about four minutes – this is very revolutionary.

We are studying problems that are meaningful to health care, such as diabetic care. We can look at millions of patient records for blood sugar levels, body mass index, age and every other risk-factor detail. Now when designing a treatment plan for a single patient, clinicians can look for other similar patients and see which treatments worked well, and identify other turning points that result in better, managed care.

Our purpose at Allscripts Analytics is to develop tools and information that help provide safe, high-quality, patient-centered care. And to provide sophisticated data analysis that helps us examine opportunities to improve the quality of health and economy of health operations.

[To learn more, listen to my recent podcast here](http://example.com).

About the author

Dan Connors, Ph.D. is Chief Analytics Officer for Allscripts Analytics. In this role, his analytics expertise guides efforts to quickly and accurately process large and complex data sets. Dan joins Allscripts Analytics after directing a high-performance computer engineering research group at the University of Colorado Denver. Dan’s research focused on the design and implementation of advanced computer systems that accelerate scientific computing applications and algorithms. His research interests include parallel programming models, compiler optimizations, run-time optimization systems and computer architecture. He has also investigated the mapping of computationally intensive applications in computer vision to modern multicore and graphics processing architectures, to enable low-energy mobile object recognition and tracking. Dan earned his Ph.D. in Electrical and Computer Engineering at the University of Illinois Urbana-Champaign.