

President Hamdullahpur, Dean Goulden, colleagues, family and friends, and especially graduating students,

I am sure I speak for everyone on this stage when I say — Convocation — it never gets old. It is just so much fun, and such a privilege, to celebrate your hard work and achievements. It is very exciting for me personally to be standing here now, and I have to add very scary. You see, it really doesn't seem very long ago to me that I was sitting where you are. And I don't feel nearly wise enough to be imparting what is supposed to be, according to tradition, advice.

There is one thing I am very confident in telling you, though. Your university, your faculty, and your own hard work have prepared you very well for an exciting future in what is by any measure a complicated world. The evidence is overwhelming: the "Jobs Rated Report" has had actuarial science, statistics, computer science on their top ten list for years. Fortune Magazine released in April its "Best and worst graduate degrees": number 1? PhD, Statistics! In the top 5? Biostatistics, Computer Science, Human Computer Interaction. And as I'm sure you've been reminded, Waterloo has been rated the top university for innovation for the 23 years running!

In a sense these ratings aren't really important, although they get a great deal of press. Every convocation speech on YouTube will tell you that it's far more important to love what you do and do what you love. And that's right. But if you are as lucky as I was, to love the unique blend of mathematics, computer science, statistics, and applications, that is on offer at Waterloo, then you are set for life.

And the reason for that can be summed up in two words: Big Data. This is itself an over-hyped catch-all phrase that is verging on losing its meaning. But what is it really?

Big data is a convenient short-hand to convey the fact that in every field, from astrophysics to economics to history to zoology, it is easier than ever before to collect many many many computer-drives full of numbers, whether from satellites, sensor networks, text mining, and a host of other technologies. Some of you will have careers in research, some in the public sector, some in the private sector. But you will all need to deal with data. Lots and lots of data. One well-publicized aspect of big data is the data being collected on you, every time you, send a tweet, post a like, answer your phone, use your credit card, go to the doctor, ... you get the picture. And if there is all this data around, we must know a lot, right? Or somebody must know a lot, because, well, we have all this big data.

Nope. Numbers and knowledge are emphatically not the same thing. Your job, whatever it is, will very likely involve helping to turn numbers in to knowledge. What do we need to turn numbers into knowledge?

We need statisticians. We need their skepticism and caution. We need the voice that says, wait, “trending on twitter” doesn’t mean we know much about the general public. Most of them don’t use twitter. The voice that says “what do you mean 10,000 responses is plenty? What happened to the other 40,000 people you said you contacted?”

We need philosophers, to think deeply about the public good and personal stake in data privacy. You may be happy with your FitBit storing your data in the cloud, but would you be happy if your entire health record was in the cloud?

We need computer scientists. We need that ebullient enthusiasm — let’s try this, and see if it works! Hey look, it works, let’s make it work better!

We need mathematicians, whose joy is to think abstractly — what’s really going here? Does it generalize? How? What can we learn from that?

We need scientists who are comfortable moving from statistics to computing to science to math to finance and back again.

We need you.

On the stage with me today are some of my teachers, some of my students, and my nearest and dearest collaborator. It is a privilege to be here with them and speaking to you: I am very grateful to the University of Waterloo for granting me this honour. But I am much more grateful for the years I spent here back in the day, for what I learned in the classroom and outside it.

Congratulations! Enjoy the evening and the weekend, feel proud of your accomplishments, and feel lucky for the opportunities your education has created for you. Thank you.