Institute and Faculty of Actuaries

Data Science Digest

September 2017

The purpose of this digest is to provide the IFoA membership with updates on some of the latest developments within data science and MAID working party updates.

From the Institute and Faculty of Actuaries MAID working party

Background

The revolution has already begun. With rapid advancements in technology, we can collect, store and draw insights from data like never before. Yes, we think that 'Big Data' is going to change the world and we want to be ready to embrace the opportunities that come along with it. The purpose of this digest is to excite and engage the profession about 'Big Data' by providing updates on some of the latest developments within data science and also MAID working party updates.

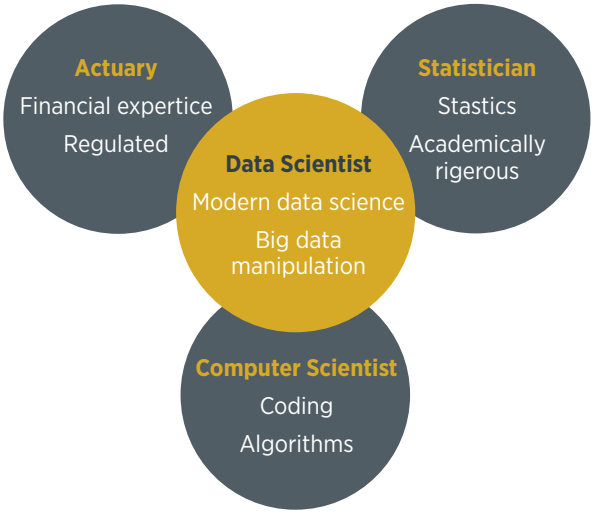
This issue which looks at some of the differences between a data scientist and an actuary, covers some of the latest 'Big Data' trends in 2017 and we also provide new MAID working party updates.

Modelling, analytics and insights from data (MAID) working party updates

What is a data scientist?

Harvard business review has called it the sexiest job of the 21st century, but just what is a data scientist?

Data scientists have a skillset that overlaps with those of other professionals. In particular, actuaries, statisticians, computer scientists all have skills that would be possessed by data scientists, as well as having their own specialty expertise not common to data scientists. The diagram below illustrates this by considering the relative strengths of the four roles:



A data scientist would overlap with the skillset of the typical actuaries in areas of statistics and modeling but data scientists would not generally have knowledge of finance or insurance work. Another key difference is that there is currently no standard qualification, or relegated profession, for data scientists.

September 2017

Institute and Faculty of Actuaries

We encourage members of the profession to seize the opportunity because the future is already here, and more than ever, we want to equip this current generation and future generations of actuaries with the right skills...

September 2017

Data scientists specialise in dealing with large and complex datasets, manipulating, analysing, and visualising these to draw conclusions or solutions to real world problems. They are also are typically trained in one or a combination of three main areas: machine learning, artificial intelligence and data mining techniques. Strong understanding and use of programming languages such as R and Python are also common to the data scientist's skill set. Data scientists work across many areas of academia and business, of which finance is just one area. According to a McKinsey digital maturity study, the travel and hospitality, retail and telecom sectors are the leaders in data science, with the public sector, pharmaceutical and insurance sectors further behind.

Data science is a global vocation, with the US private sector, and companies such as Google, Facebook, Amazon, IBM and Apple, seen as being at the forefront.

We are also seeing qualifications in data science are being offered by leading US and UK institutions such as the University of California Berkley, MIT Sloan, Stanford, Cambridge, Oxford, Imperial, UCL, Kings and many others.

For actuaries wanting to get up to speed on these new technologies there is a wealth of free study resources. For example the online training organization Coursera has partnered with many of the words leading universities to offer free online data science courses; An example of this is their popular 10 week online Stanford University course on machine learning. For those interested in delving into real world projects, Udacity also offers courses but in partnership with leading forward thinking companies such as Google, Facebook, IBM and AT&T.

In conclusion, we think there is an obvious overlap between the skill sets of data scientists and actuaries, but each also has their own areas of expertise and operates in different domains. The availability of high quality free courses and material to learn more about the latest data science techniques is an exciting opportunity for actuaries to take the initiative and expand their skills into this rapidly evolving field. Members of the profession should seize the opportunity because the future is already here, and more than ever, we want to equip this current generation and future generations of actuaries with the right skills to remain relevant and valuable in our domains.

'Big Data' trends in 2017

What would the skills of the future actuary look like?

Well, we don't have the answer just yet and this is the whole point of this working party. but it's a good question that members of the profession should be asking. This article explores the rapid pace at which AI is impacting and disrupting every major industry from automotive to health care and the shortage of skills in supply. What do you think, are we equipping ourselves to remain masters of our domains? Read on, to find out more.

https://www.forbes.com/sites/forbestechcouncil/2017/06/26/machine-learning-is-creating-a-demand-for-new-skills/#1abb88f87ae2

Artificial Intelligence - will banks eventually catch up?

Both threat and opportunity, we are seeing industries overhauled by AI. The 'quantitative hedge' fund industry is no exception as assets under management have doubled from 2009 to $918b and given the vast amounts of data being produced and processed on a daily basis. Many of the biggest hedge funds already use computer algorithms to make trading decisions. However, we are seeing some

Institute and Faculty of Actuaries

Life insurers are exploring technology that uses facial analytics and other data to estimate life expectancy as part of the underwriting process.

of these large funds starting to employ machine learning techniques to gain a competitive advantage by unlocking the hidden returns in the swelling sea of "Big Data". Indeed, AI is set to disrupt again. This article looks at the impact of AI on equity hedge funds and paints a picture of a future of AI driven trading.

https://www.forbes.com/forbes/welcome/?toURL=https://www.forbes.com/sites/adelynzhou/2017/05/29/financial-services-industry-banks-artificial-intelligence-slow-adoption/&refURL=https://www.google.co.uk/&referrer=https://www.google.co.uk/

How your selfie could affect your life insurance

Your selfies may be used for more than getting likes in the future. Life insurers are exploring technology that uses facial analytics and other data to estimate life expectancy as part of the underwriting process. Using 100s of facial data points, the technology would be able to determine metrics such as BMI even through makeup. The ease, speed and cost-reduction benefits are obvious for both insurers and consumers, but the true test will be in the accuracy of predictions. This same technology could also be used as to identify early warning signs of diseases such as diabetes or heart disease. This article looks at the continuing impact that data science is having on the life insurance industry.

https://apnews.com/e06fb5b89f9b439a844bc8dbddd1705d/how-your-selfie-could-affect-your-life-insurance

The Rise of the Smart City

Cities are increasingly utilising big-data technologies to make their cities better places to live and work. Low-cost cloud-computing solutions, inexpensive sensors, developments in machine learning, and ubiquitous smart devices are the key drivers behind this transformation of how cities operate. City officials are employing advanced data analytics to tackle old problems as well as discover new ones such as using GPS enabled inhalers to identify heavily polluted areas, or using predictive models to guide health inspectors to high-risk restaurants pre-emptively. As these programs develop, there are still hurdles to overcome before large-scale adoption. The efficiencies created must be carefully balanced against the perceived privacy risk brought on by the widespread collection and storage of data used to facilitate them.

MAID working party updates

MAID	Update
Workstream 1	• Published finding from member research and now planning next phase • Vacancy for new Chair person
Workstream 2	• Progressed four case studies and aiming to publish a paper late summer; also planning next stage so open to new case studies
Workstream 3	• New leadership and continuing to explore wider opportunities for actuaries
Workstream 4	• Provided an update to IFoA Council on 4 July 2017 in a paper setting out progress towards the IFoA data science strategy, including highlighting feedback from previous activities and outline plans for future activities

September 2017

Institute and Faculty of Actuaries

Beijing

14F China World Office 1
1 Jianwai Avenue · Beijing
China 100004
Tel: +86 (10) 6535 0248

Edinburgh

Level 2 · Exchange Crescent
7 Conference Square
Edinburgh · EH3 8RA
Tel: +44 (0) 131 240 1300
Fax: +44 (0) 131 240 1313

Hong Kong

1803 Tower One · Lippo Centre
89 Queensway · Hong Kong
Tel: +852 2147 9418

London (registered office)

7th Floor · Holborn Gate
326-330 High Holborn
London · WC1V 7PP
Tel: +44 (0) 20 7632 2100
Fax: +44 (0) 20 7632 2111

Oxford

1st Floor · Park Central
40/41 Park End Street
Oxford · OX1 1JD
Tel: +44 (0) 1865 268 200
Fax: +44 (0) 1865 268 211

Singapore

163 Tras Street
#07-05 Lian Huat Building
Singapore 079024
Tel: +65 (0) 6906 0889

September 2017

The IFoA hosted a Data Science Summit at Staple Inn Hall on 12 – 13 September 2017. The main objective of the summit was to provide a platform for an engaging discussion on the data science initiatives undertaken by different actuarial associations. This will enable the profession to jointly address some of the challenges, share ideas and potentially develop strategies on how to make the most of this opportunity. We will update on the event soon.

If you are interested in submitting an article that you think is interesting, exciting and of course 'Big Data' relevant please contact Sharon.cumberbatch@actuaries.org.uk for further details.