



MSBAPM NEWSLETTER

September 2017 Edition



UConn School of Business – Toastmasters Club

(Open House Session on 5th September 2017)



THIS MONTH

in the MS BAPM
Newsletter..



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See you in October!

SHORT NOTES BEFORE DIVING IN..



We are all pleased to welcome Neelakshi Saxena from the class of Spring 2017 into the MS BAPM Newsletter editorial team. Neelakshi brings with her a ton of writing experience and has been an editor with her Department Newsletter during her undergrad days.

I am an avid reader and writer and love to dance. I plan to go into full-fledged writing mode in future. I am really excited to be a part of the newsletter team as it'll give me ample of opportunity to interact with people.



How is Machine Learning at work different from school?

– Yashwanth Musiboyina



Setting Expectations

I greatly admire the work by some researchers in academia that helped build algorithms to solve complex problems. This article in no way underrates the power of academia and its continuous efforts to improve Machine learning. It illustrates some learnings from my experience on what academic projects inside undergraduate/ graduate class setting lack in preparing students towards real-world machine learning projects. While most of them may seem obvious, I hope you find something useful or worth debating about.

My first encounter

In Fall 2013, at the beginning of my undergrad senior year, I landed a job with a pure-play decision sciences/analytics firm. I must admit that I was underqualified to be a data scientist as I was terrified by programming and had little context on business problems. However, Math had always been my forte which was a sign of relief given the extent to which it's applied in data science.

As luck would have it, I had the opportunity to naively apply artificial neural networks for a capstone project where my major had less to do with

machine learning. Little did I know about the amazing problems that neural nets were helping people solve. A question I had until the next one year was why was it called 'Machine' Learning when it's indeed the human who's programming to optimize the parameters in the model. A year down the line, one of my mentors resonated with me on how it's not as magical as sci-fi movies portray it to be: when you look under the hood, most of the basic machine learning models are statistical models powered by the computational ability of machines.

What's the problem?

Predictive modeling class projects and competitions come with semi-tidy datasets and decently-defined problem statements. In real-world projects, while there is enough time spent on cleaning data, there's much more time spent figuring out what is the next problem to solve and getting all kinds of data that help it. As machine learning and data-driven decision-making become ubiquitous in business, this issue may get resolved sooner. Nevertheless, problem definition is the most important aspect of a data scientist/ machine learning engineer's life.

The Convenience of Static Data

Although class projects are an effective way of learning the practice of model design and evaluation, they are simplifications of problems data science practitioners go through. Model performance in a class project is based on predictions made against data from a fixed time frame. However, updating model estimates with the latest data is a common practice in the industry.

One commonly addressed statistical problem is the presence of feedback loops. For example, consider a system for recommending content on a user's homepage. This likely relies on historical user clicks as training labels, which in turn depend on previous predictions from the model. Hence, the system would quickly decide only to recommend content that users have already clicked on.

Identifying such feedback loops is hard when we cannot identify the dependent variables that are causally connected to model predictions.

Offline vs. Online Evaluation

The SEMMA approach (Sample Explore Modify Model Assess) is a great offline way to arrive at the best model for a given problem in school as well as real-world projects. Identifying the model with right evaluation metrics (AUC, MAPE, etc.) while accounting for Bias-Variance tradeoff concludes an academic/ class project. Unfortunately, it's just a start to a promising model worth testing online. The most popular approach in online experimentation is to perform A/B testing.

While this concept deserves an exclusive article for itself, I will try to concisely explain the intuition. A/B testing is used to measure the difference in a metric against two statistically identical groups A & B that are exposed to two different models. For example, to test a new recommendation algorithm on a website, Group A is exposed to a null model (status-quo or no change to the website) while Group B is exposed to the best offline model (new set of recommendations). We then measure the difference in click-through rate of group B against group A keeping statistical significance in mind. A point to be noted here is - while short-term metrics give a sense of the lift the models give, it's important to identify OCE (Overall Criteria for Evaluation) that are more long-term in nature, e.g., customer engagement, to evaluate these experiments.

Changing Anything Changes Everything

Academic projects and machine learning competitions operate with historical data for both training and evaluation where the prediction of interest had happened. The biggest complaint I have which most data scientists would also relate to is the unfair question often asked of Data Scientists at work

- "Can you predict how tomorrow will be? By the way, I don't have yesterday's data yet!"

In a world where business changes faster than data ingestion, it's important to modify data states that are representative of such changes before training a model. It turns out to be a can of worms when such carefully trained models get tested against data from subjects whose business context changes. For example, imagine you have a Netflix account with a basic single-device plan that you've been exclusively watching video content for years. Is it fair to expect Netflix to recommend content that suits your new partner and your preferences without watching a good number of videos together?

In a machine learning model that uses x_1, x_2, \dots, x_n variables, changes to the distribution of any of these variables may potentially affect the weights and importance of the remaining variables irrespective of retraining the model fully in a batch/ online adaptive fashion. One way to mitigate such issues is through isolating models and serving ensembles, a popular route to winning competitions that are not always scalable in a real-world setting.

Final Remark

Having written all of this, I must admit that I've had a strong urge to go back to school and learn about algorithms I couldn't lay my hands on at work. Ironically, I can't wait to get back to learning by implementing them. I hope it's a good problem to have, given all the jazz surrounding a data scientist's job, which gets described as the 'The Sexiest Job of the 21st Century.'

References

- <https://papers.nips.cc/paper/5656-hidden-technical-debt-in-machine-learning-systems.pdf>
- <http://ai.stanford.edu/~ronnyk/2013%20controlledExperimentsAtScale.pdf>
- <https://hbr.org/2012/10/data-scientist-the-sexiest-job-of-the-21st-century>

Value Analysis of an iPhone

- Anoop Ramathirtha

Disclaimer: The following is a light-hearted (yet fact-based) analysis of the value of an iPhone. Some lines might contain sarcasm and tongue-in-cheek comments. Proceed with caution.



At a typically grandiose keynote event held at its new campus in Cupertino last week, Apple launched the newest iPhone - the iPhone X (pronounced “iPhone ten”).

The previous version was the iPhone 8, which was launched about, erm, 15 minutes before that. The iPhone X, however, is supposed to be in a different league altogether. It's not just an iteration with exciting new hardware features and improved software updates. It is supposed to usher in a new era of smartphone technology, not just for Apple but for the world.

The iPhone X would set you back by about \$1k (pronounced one thousand dollars). And this would only get you the lower end of the unlocked 64GB version. The price might intimidate some, but people have always been willing to shell out the

asking price to buy an iPhone. Because of this, Apple accounted for a staggering 83% of all profits derived out of smartphone sales, as of the first quarter of this year. Apple makes way more money by selling a unit of the iPhone than what it spends to manufacture the same. So, how does it add value to the customers who are willing to buy it by paying that extra amount?

Is the iPhone a valuable product?

In Value Engineering, the *value* of a product is defined as the ratio of its features to its cost. It is easy to understand that the value can be increased in two ways. First, by increasing the features that the product has to offer, and second, by lowering the cost. We will try to analyze value by splitting the constituents of *features* into tangible and intangible components and measure them in terms of *cost*.

Some of these features that can be measured overlap with what is known as “the dimensions of quality” – *Functionality, Quality, Reliability, Durability, Safety, and Serviceability*. The intangible components are where it gets interesting. We look at *Perceived quality* and *Esteem value*.

Functionality

Apple is known to be the pioneer of many features that are now common on a smartphone. In recent years though, many of the functionalities introduced to its loyal users by Apple have not quite been groundbreaking new features. For example, The iPhone X comes with a “newer screen technology” called the OLED screen, The New York Times gushed in its review of Apple's latest offering. Phones with OLED screens have been around for nearly ten years. Same with wireless charging or phones with larger screen sizes. Even so, Apple is still known for innovation today and spends a large amount of money on research and development (about \$10.5b last year), which means they continue their quest for innovation and keep working to make

sure they deliver on the planned features. The cost seems accounted for.

Quality, Reliability, Durability

As far as quality and reliability are concerned, it is hard to argue with the fact that iPhones are value for money. The iPhone's cameras have been superior, the processors powerful. The A11 "bionic chip" in the new phones comfortably beat other flagship phones on speed and performance in several benchmarking tests. Here, a customer gets what he paid for.

Safety

iPhones are not known to catch fire on planes.

Serviceability

Apple's customer service is known to be exemplary. In fact, analysts believe that this is one of the factors that contribute to the creation of strong customer loyalty. It is said that Steve Jobs borrowed much from five-star hotels while setting up the first Apple Stores. Maybe a part of the cost is justified for the royal treatment if the iPhone owner ever has to go back to them.

From a buyer's perspective, all these accounts for only a fraction of the cost of an iPhone. Many would argue that other manufacturers deliver similar features at a similar or lower cost. A look at some intangible parts that are part of its features might reveal why iPhones are so popular.

Perceived quality

Apple's marketing has always been a cut above the rest. They have ensured that the users know that they make the best phones. Their commitment to quality means that they have to be able to sustain and build on this reputation. Today, people associate the brand with high-quality phones.

Esteem value

The trump card up Apple's sleeve. Esteem value is the value derived out of the feel-good factor that comes with owning a product. Sometimes closely related to aesthetics, but most often, to brand value. This is the major part of the difference between the cost of manufacturing an iPhone and its price.

This is the biggest reason why iPhone consumers are willing to pay the asking price and hand Apple a hefty profit. A large majority of the owners are convinced that the iPhone is the best phone that money can buy.

For some, it is just another flagship phone. But for those who take great pride in owning one, the iPhone is a highly valuable product.

7 Questions with Faculty: Chris Field



Briefly, give us an introduction about yourself, please.

I grew up in Connecticut and then attended college at the University of Richmond with majors in Leadership Studies and Political Science. After graduating in 2001, I joined the Army where I spent four years on active duty stationed in the United States and overseas.

I spent most of the next decade exploring the private sector by working in different industries and living in states all across the country as well as serving in the Army Reserves. My last job in the industry was with the defense contractor Raytheon. When I returned to my home state of Connecticut, I pursued my graduate education here at UConn and earned the MSBAPM degree. I have been fortunate enough to spend the last couple of years teaching here at UConn. I started as an adjunct faculty member with OPIM in January 2016, and I have just started a full-time position to help expand the BAPM program to the Stamford campus.

How did you land your first teaching job?

My first job teaching was as an instructor for the Army. I had been trained and qualified as a military instructor during my time with the Army Reserves. This led to my position with Raytheon where I had the opportunity to train soldiers on a full-time basis. My first job teaching here at UConn was the result of relationships built during my time as a student in the program. Thanks to the encouragement and support of former professors such as Jose Cruz and John Wilson along with my academic and professional track record, I was invited by Ram Gopal to teach as an adjunct faculty member.

What excited you to be part of the BAPM Faculty?

It's an amazing job! I love to participate in the pursuit of excellence. We work in a domain that is on the cutting edge with applications across so many different industries. The department and the program are constantly looking for ways to innovate and to improve. Every semester I have the opportunity to hone my craft as a teacher and to explore new ways to improve my classes. Our students are smart and driven, and I love to support them in their efforts to advance in their careers and to make a positive impact in the world. I am surrounded by faculty and staff who are so welcoming and who are working on some amazing projects and research. How could I not be excited to be a part of the program?

What would you like to improve at BAPM?

I want to build on our strong foundation by continuing to look for ways to align our curriculum with the needs of industry and to cultivate relationships with major employers. Nothing makes me happier than when a student shares how something they learned in class helped them at work or helped them get a new job. My goal is to generate a lot more of those experiences!

What advice would you like to give to graduating BAPM students?

Never stop learning. The best performers that I've seen are always looking for ways to improve, and they stay intellectually humble. They are constantly experimenting and exploring to find that next incremental step forward. It's amazing to see how those little advances can add up over time.

What are your hobbies and interests apart from making BAPM great?

This time of year, its watching football. I enjoy getting outdoors as often as I can whether it's hiking, kayaking, going to the beach or golfing. I also enjoy reading. My interests are pretty eclectic so one day you might find me reading works of the ancient Greeks and the next a book on sports.

Tell BAPM something surprising that we do not know.

After college, I celebrated St. Patrick's Day in Dublin, Ireland in May! The weird part is that the holiday is actually in March, but all of the festivities had to be postponed due to concerns about an agricultural disease earlier that year. I was in the country for three weeks with a group of students doing service projects and traveling. We lucked out, and we were able to raise a pint of Guinness as the parade went by two months after the actual holiday.

Competition

- Sonakshi Singh



Challenger defines it “to compete”
Contender leaves it till defeat
But the race remains the same
The winner is the one who ends the game

One who hard fought maybe the loser
But both will realize this sooner or later
The world is bright because the sun undergoes
reactions
Earth meets sky only at the horizon
Clouds celebrate only after they cry
Fledglings’ cut-throat before they fly

Defeat doesn’t finish a man
He is finished when he quits
Important is what you have gained
While the withdrawers ran in vain
A man can be destroyed but not defeated
It is your grit that makes you sane.

Clubs at BAPM – Toastmasters

UConn School of Business Toastmasters Club is where Leaders are made.

Every great leader, if you observe, understands that it is not just the content of the speech that matters, but how it is delivered. There are scores of articles and papers published; TED talks delivered that reiterate the same. That a leader, at any level, should connect with the audience. Strike an emotional chord.

To make such leaders is why the Toastmasters Club exists. The club here at UConn School of Business offers a great opportunity for every student to be a part of the prestigious club which carries with it a legacy of about a hundred years. Since, the inception of the club in 1924, Toastmasters International has evolved into a community of speakers and presenters spread all across the globe, spanning 142 countries and 17000-member clubs.

The Toastmasters club at UConn School of Business is even special as it has a unique role to play in transforming and shaping careers of students. Every UConn student member of the club is offered a platform to polish her/his presentation and communication skills, during weekly Toastmasters sessions. Before you think this is just for those folks who have a fear of public speaking and you have no such fears, Toastmasters International is also your best chance to practice and receive feedback from your peers. There is always room for improvement and stepping up your game in delivering flawless presentations.

As a club, Toastmasters meets every Wednesday from 4:15 to 5:45 PM. Every session lets you network with your peers and share mutual learning as a takeaway from each session.

To know more, contact Kaushiki Dutta, Vice President - Membership at (929)284-5323
