An Interview with Dr. Michael Zeller, Winner of ACM SIGKDD 2020 Service Award

ABSTRACT:

Michael Zeller, Ph.D. is the recipient of the 2020 ACM SIGKDD Service Award, which is the highest service award in the field of knowledge discovery and data mining. Conferred annually on one individual or group in recognition of outstanding professional services and contributions to the field of knowledge discovery and data mining, Dr. Zeller was honored for his years of service and many accomplishments as the secretary and treasurer for ACM SIGKDD, the organizing body of the annual KDD conference. Zeller is also head of AI strategy and solutions at Temasek, a global investment company seeking to make a difference always with tomorrow in mind. He sat down with SIGKDD Explorations to discuss how he first got involved in the KDD conference in 1999, what he learned from the first-ever virtual conference, his work at Temasek, and what excites him about the future of machine learning, data science and artificial intelligence.

CONGRATULATIONS ON RECEIVING THE SIGKDD SERVICE AWARD FOR YOUR CONTRIBUTIONS AS VOLUNTEER TREASURER AND SECRETARY TO THE EXECUTIVE COMMITTEE OVER THE PAST 8 YEARS. TELL US ABOUT YOURSELF. WHO IS DR. MICHAEL ZELLER?

Oh goodness, where to start? If I had to sum it up, I like to describe myself as a scientist turned entrepreneur. I'm always curious to learn more about technology and what it can do for us — how it can improve the way we live or the way we work. The applied side is my passion – taking fundamental algorithms and turning them into software applications which solve particular requirements. Envisioning a solution for a business problem and seeing it emerge as a new product is incredibly rewarding. Along the way, you get to work with interdisciplinary teams, from data science to engineering, from product development to marketing and sales. Then, as an entrepreneur, the art is to bring together exceptional teams and turn an idea into a venture. What could be more fun?

I strongly believe technology is the key to creating a better future for us and our children. It is the key to creating a more sustainable global economy, a longer and healthier lifespan, and economic prosperity across emerging economies. From that perspective, I love what I do. I feel like a kid in a candy store working within the tech field every day. I am lucky I do not consider it work; it's fun working with data science, AI and machine learning to solve problems.

WHEN DID YOU DECIDE TO GO INTO THE FIELD OF DATA SCIENCE, AI AND MACHINE LEARNING?

Well how did I get here? It started when I was studying physics and computer science initially in Frankfurt, Germany, then continuing on with a visiting research scholarship at the University of Illinois at Urbana-Champaign, and finally with a post-doctoral fellowship at USC. Then it was time for me to move from academia to industry.

While working on the research side, I started studying at nonlinear dynamics of neural networks. It was the early days of AI and machine learning. I quickly drifted into the applications related to computer vision and robotics. Practical applications were always the most fascinating part of AI to me, rather than the pure theory of algorithms. It is interesting to see how these theories and algorithms that we worked on 10 or 20 years ago have now turned into mainstream applications for business applications. There was no way for us to know back then that our work would have such a widespread impact.

WHEN DID YOU FIRST DISCOVER KDD? WHAT ATTRACTED YOU TO THE COMMUNITY AND KEEPS YOU COMING BACK EACH YEAR?

I first became aware of KDD in the very early days of the organization when I attended a conference in San Diego in 1999. I had just moved there at the time and was intrigued with a program that was called "Knowledge Discovery and Data Mining (KDD)". It wasn't until KDD 2009 in Paris that I became a regular attendee. In 2011 — again in San Diego — I started to serve in various volunteer roles, starting as co-chair of the industry and government track, more commonly known as the Applied Data Science track today.

I am most attracted to KDD's balanced mixture of research and real-world applications. The conference provides hands-on workshops, as well as keynote lectures from leaders across the field. I keep coming back each year for the constant and consistent opportunity to learn about the latest developments, applications and technology, and to be part of this growing global community.

WHAT EXCITES YOU ABOUT THE FUTURE OF KDD AND THE INDUSTRY AS A WHOLE?

The best part of KDD is that I think we are just scratching the surface of AI and machine learning. The application of AI is profound — comparable even to the rise of the Internet. It has such a tremendous impact across every industry and pushes enterprises to make smarter, more efficient systems.

The core algorithms have been around for decades. If we look back, we had two "AI winters" where the AI community overpromised but under delivered, resulting in many researchers turning away from the field. However, now we are at a unique point in time because the improvements in the algorithms — like deep learning architectures which culminated in the 2018 ACM A.M. Turing Award — the availability of data and processing power at an accessible price point gives us economic viability and capability to really implement solutions. Suddenly, we're turning research and one-off solutions into mainstream applications.

I can't envision a future or environment without AI and machine learning in some capacity. KDD is now part of this wave and I'm excited to see how the conference and the field evolves over the next decade. We'll continue to attract the world's leading researchers but we also have the opportunity to educate the broader community. Beyond being a platform for learning about data science, KDD is setting standards, and providing a strong and influential voice on topics of AI ethics and fairness, diversity and bias, and the responsible application of AI in general.

WHAT WAS YOUR MAIN TAKEAWAY FROM HOLDING THIS YEAR'S CONFERENCE VIRTUALLY? WHAT KEY TAKEAWAYS CAN FUTURE ORGANIZERS APPLY TO PLANNING UPCOMING CONFERENCES, WHETHER THEY ARE IN-PERSON OR VIRTUAL?

Well, it was a lot of work! Having to transition to an online format on very short notice was not ideal but thanks to our great team of volunteers, we were able to pull it off. I think this year showed our team's resilience and flexibility to rise to an occasion. We had to critically look at every part of the conference and ask how we could transition it to a digital format while still offering an excellent experience for all attendees. We learned what we can tweak for future conferences. Moving forward, we plan to use a hybrid format of virtual and in-person events. Our biggest lesson and reminder was that it is always okay, and even great, to reinvent yourself. We strive to maintain KDD's reputation as the leading data science conference by continuously adapting to changing circumstances to provide leading research and industry insights no matter what. In doing so, we keep the program relevant and fresh.

AS THE HEAD OF AI STRATEGY AND SOLUTIONS AT TEMASEK, CAN YOU SHARE SOMETHING YOU ARE CURRENTLY WORKING ON THAT REALLY INTERESTS YOU?

As a global investment firm, we work with an international portfolio of companies across all verticals to establish data science competence. Like I mentioned earlier, AI is applicable to every industry. At Temasek, we view ourselves as generational investors, looking at the long term effects of AI and other technologies to potentially impact business models over 10-year periods. We look at key trends beyond a pure financial return; we try to incorporate environmental, social and governance (ESG) considerations into investment decision-making and management.

WHAT DO YOU BELIEVE ARE THE BIGGEST CHALLENGES FACING THE MACHINE LEARNING/DATA SCIENCE SECTORS?

There are two main challenges when it comes to data science and machine learning. The first is the misconception of what AI can accomplish. Some people believe it can do anything and solve everything, which is clearly not true. It is our job as practitioners and leaders of the community to calibrate the wider audience to understand what AI and data science can do.

The other challenge is the fear around AI. Concern over the elimination of jobs, ethical practices and potential dangers of misuse are valid issues the AI community at-large needs to address head on so we can better manage expectations and determine an ethical approach. If we promote the use of AI for the betterment of society, rather than feeding into the perceived threat, like stealing jobs or surveillance, we can curb fear early. At the end of the day, data science and AI can do a lot of good. That needs to be our primary focus.

IF YOU WERE TO GIVE THE NEXT WAVE OF RECENT GRADUATES SOME ADVICE ABOUT GETTING STARTED IN THE DATA SCIENCE FIELD, WHAT WOULD YOU SAY?

I think it boils down to the fundamentals of math and science as the foundation of a well-rounded education in AI, data science and machine learning. Data literacy will be a huge part of the future curriculum. Without it, we risk creating different classes of students, with some fearing data rather than viewing it as an opportunity to solve the biggest challenges.

But above all else, if you are passionate about a certain topic, go deeper. Find a data science team with deep expertise in machine learning that allows you to get exposed to variety of projects and the entire project lifecycle, from initial data ingestion and feature selection to the operational deployment of your models in production. Join an organization that will allow you to learn about the latest technical developments but also emphasizes the importance of business requirements.

LASTLY, WHAT DOES THE SERVICE AWARD WIN MEAN TO YOU?

Of course, it is a tremendous honor to receive the service award knowing that so many people deserve it. I am just one representative of many people who have been serving KDD for a number of years. The award will have a special place on my wall and serve as a reminder of all the great friendships I've formed over the years and the great things I've learned. I'm lucky to be part of a community that is excited to learn and always researching the next big thing.