Podcast Title: *ACM Bytecast*
Episode Title: Suchi Saria

Welcome to the *ACM Bytecast* podcast, where researchers, practitioners, and innovators share about their experiences, lessons, and future visions in the field of computing research. In this episode, host Rashmi Mohan welcomes Suchi Saria - Associate Professor of Computer Science at John Hopkins University and leader of groundbreaking projects with top government organizations like NSF, NIH, DARPA and FDA.

The conversation starts off with a look into Suchi's background. Growing up in India, it wasn't common for young girls to be interested in computing. Suchi's introduction to computer science was via her older cousins. While reading a book on the subject she came across a passage discussing AI and the future, an area which really fascinated her. Machine learning was just beginning to take off at this time and her first experience was in robotics with a Lego Mindstorms kit. Suchi reveals that she actually began her education in art school and, for 10 years, was highly focused on all aspects of art and design.

Then, they discuss the intersection of machine learning and healthcare. Suchi believes she was lucky to be at the forefront of the two fields's initial crossover. She explains the sheer amount of data generated on regular doctors visits which is limited in terms of serving to make decisions. This is where the healthcare industry continues to be lacking. The example scenario is given of delayed diagnosis, which only furthers complications and leads to a negative experience for the patient. The use of smart technology to identify patients in need in order to give them proper treatment is where Suchi believes we should be at this point, but we aren't.

Rashmi then inquires about the key problems Suchi observes in the healthcare industry that she would like to see promptly addressed. From the healthcare standpoint, she describes the stresses faced in a hospital setting, where staff faces limited time to properly address the high number of serious demands. This paradigm is not suited for doctors to catch smaller issues earlier on in caring for a patient. If we could flip that with machine learning, she says, the doctor could continuously be analyzing data generated. Thanks to policies such as the Affordable Care Act, electronic infrastructure has begun to be more widely adopted within the industry. She hopes for a service that would pull together all of this data, integrate it and ultimately identify what a person may be at risk for, making it easy to act.

Then, she shares some of the problems regarding technology. In fields such as advertising and healthcare, data is generated from hundreds of various sensors. Integrating all of this data requires a deep understanding of the factors themselves. Safety, risk and bias are other concerns when collecting data. In order to make these outputs actionable, they must be interpretable, safe and bias-free. What techniques promote that? Finally, she brings up the notion of human-machine teaming. What does human expertise look like when working alongside machines? There is a certain way machines have to be built to allow for teaming, which is a conflict currently being considered and tackled.

Given the amount of data generated by each patient, it would be impossible for every individual piece to be analyzed. In Suchi's model, the irregular data would stand out, allowing for the

doctor to note specific abnormalities. The data being measured is intentional and precise, and this intentionality and data may work together to lead to important inferences. When using this data, knowledge of both the technology and its philosophy have to be present.

Many concerns of data collection arise from a misunderstanding of the motives and intention behind it. There is the question of ethical considerations behind data collection and where this responsibility lies. The most important thing is having more responsible, careful leaders in the field to determine and transparently discuss policies.

Suchi then discusses her transition from research to practice. She has found much satisfaction to be able to bring all of the hard work present in research to fruition. The majority of researchers are working tirelessly towards impact, though research alone doesn't make an impact. Suchi observes a big gap between what was needed vs. how to address these needs. Motivated by impact and working backwards, she found it easy to mesh the two worlds together. Going against traditional academic culture is what she has found most difficult.

As the conversation comes to a close, Susi offers her best advice for students interested in computing. She says to find mentors and reading material to energize and inspire you in your work. The most important thing, however, is finding genuine joy in what you do. She then compares engineers to creators and relays the superpowers they possess. Her focus and daily inspiration lies in the idea of overcoming the barriers and making data available and usable for positive impact.

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1:27 Suchi's background
6:00 - How machine learning and healthcare intersected
8:40 - How to convey the importance of healthcare data
11:55 - Key healthcare problems Suchi sees and wants to address
17:14 - Technological problems and challenges
23:45 - How can you get accurate results from generalization?
27:15 - How should the data be used?
29:37 - Ethics of data collection
32:50 - Suchi's transition from research to practice
37:40 - Suchi's advice for students interested in computing

Links:
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