Putting a Dent in the Universe …
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On March 30th, 2016, I was honored to give the 2015-16 Faculty Senate Distinguished Lecture. In the presentation, I covered my background that led me to a faculty position at Mines in 1998, considered 30 innovations from the previous 30 years, to illustrate the impact computing has had on our world, and proposed changes I hope Mines will consider making in the future. This piece briefly summarizes my Distinguished Lecture.

IMPOSTER!
I suffer from the Imposter Syndrome, which means I attribute many of my successes to being “no big deal” and secretly worry that others will discover I’m not as bright as they might think. The fact that I suffer from this syndrome is not surprising, considering I match two of the three attributes for “who’s most at risk of the imposter syndrome”: I am a first generation professional and I work in a job viewed atypical for my sex. Since the third attribute is being a student, I suspect many Mines students (especially our underrepresented and first generation students) also suffer from this syndrome. I strongly urge the Mines faculty to learn more about the Imposter Syndrome and help support our students. In fact, in my opinion, Mines should require CSM 101 mentors to teach the lesson available on the Imposter Syndrome.

INNOVATIONS!
The 30th anniversary of the PBS Nightly Business Report considered 30 innovations that had the greatest impact on business and society. We looked at these innovations and counted the number where computing was involved. At least 22 of the 30 innovations required people with computing expertise, and several attendees counted all 30. In short, computing has put a dent in our
EVERY STUDENT SHOULD LEARN TO CODE
Every student at Mines should learn how to code, as every field is becoming an information field. Coding helps develop critical thinking skills and is a valuable skill. According to the latest U.S. Bureau of Labor Statistics predictions, 77% of new jobs in STEM and 58% of all jobs in STEM (factoring in replacements) are in computer occupations. With the pervasiveness of computing in our society, Mines should require a coding course for all our students. CS faculty can help make this goal happen!

COMPUTING IS SOARING IN K-12
The AP CS Java Exam is the fastest growing AP exam, and the new AP CS Principles Exam is expected to have even more test takers. President Obama recently pledged $4 billion to fund a “CS for All” program to educate K-12 teachers, as nine of 10 parents want their child to study computer science but only one in four schools teach computer programming. With several state policy changes at the K-12 level, students entering Mines will soon have more computing skills than ever before. If all entering Mines students had a quality education in computing, how do we need to change? I believe Mines should create a flexible degree program that allows students to study their passion in a particular major and add further education in CS. A flexible CS+X degree at Mines would get students, parents, and industry excited.

HOW BEST TO INNOVATE?
Innovation requires inspiration, planning, goals, action, failure, more inspiration, etc. While complex, one thing is clear -- diverse teams are more successful teams. Research studies validate that groups with greater diversity solve complex problems better and faster than homogenous groups. Is Mines creating opportunities for innovation through diverse faculty teams? In 2000, 16.5% of the T/TT faculty were women; by 2015, this number increased to
20.3%. While the percentage is up, it will take 60+ years to reach parity at this rate! In order to innovate, Mines needs to hire more diverse faculty in the T/TT to join our research teams.

**WE ARE BIASED**

We are all biased, and many studies have shown how detrimental unconscious bias is in hiring and promotion. With identical resumes except for the name, Jamal had to send 15 resumes while Greg only had to send 10 to receive the same number of callbacks. With identical promotion packages except for the name, reservations about Karen’s package were expressed four times more often than on Brian’s. Sadly, stereotype biases often play into our evaluation of candidates.

Everyone has shortcuts that help us make sense of the world. These shortcuts, however, sometimes make us misinterpret or miss things. Unconscious bias is likely to occur when (1) there exists a lack of critical mass (2) there exists stress from competing tasks, and (3) there exists a time pressure. Mines faculty need to be aware of our biases (take the Implicit Association Test) and take our time when evaluating candidates to hire, tenure, or promote.

**IN SUMMARY**

Mines can put an even larger dent in the universe by sharing the Imposter Syndrome with all students, learning about our biases (and how to avoid them in evaluation), and bringing a more diverse faculty to campus (to innovate better and faster). With the pervasiveness of computing, we should also teach all our students to code and consider creating a flexible CS+X degree program that would get our extended community excited.