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Happiness + Mathematics and Computer Science = _____ ?

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With gratitude I submit that I am the happiest person I know. And, also with gratitude, I am glad I resisted laughing out loud upon hearing the topic of the recent dedicated semester devoted to “happiness.” Next to Judaism and its Cultures, the United Nations Millennium Goals, and Immigration, I admit I thought it was a bit hard to take happiness seriously as a topic for academic reflection. At first.

As the chair of the department of Mathematics and Computer Science, I have been frustrated that we are often left out of the dedicated semester when it comes to courses. Math is “a horse of a different color,” and the important topics chosen for the dedicated semesters usually do not fit with mathematics or computer science. We did manage to offer a section of Introduction to Statistics that had applications to the Millennium Goals. And we are planning to help with technology and disabilities in the future, but happiness and math? Most people would agree that the two do not go together. I am not most people. I am a very happy mathematician who had a career as a computer scientist before getting a Ph.D. in math. I am proud that I did not laugh when the theme was announced, but I am not proud that I did not give the theme more serious thought. However, I will never forget that deep into that very tumultuous semester preparing for a course in Artificial Intelligence, I read the following: “Because ‘**happy**’ does not sound very scientific, economists and computer scientists use the term **utility** instead.” [Russell and Norvig, p. 53]

In this text, *utility* is explained as “the quality of being useful.” Somehow *usefulness* is more scientific and acceptable in my academic world than *happiness*. So perhaps my discipline ingrained my bias. We as mathematicians and computer scientists seem to eschew happiness as a serious academic topic. But should we?

As the semester progressed, many scholars whom I respect contributed to this idea of happiness as a subject worthy of academic reflection. As always, I participated as much as I could and tried to

keep an open mind. I realized there is a perspective of happiness I had not considered.

I was reminded often of the words “Life, Liberty and the pursuit of Happiness,” by Thomas Jefferson. These are our inalienable rights, endowed by our Creator. That’s important. I finally decided that, happy as I was, I had something to learn about happiness, and accepted the offer to reflect upon this. Is there a way for me to think about happiness in the academic realm--as a mathematician and computer scientist?

Perhaps, Happiness + Mathematics and Computer Science = Utilitarianism. I understood that utilitarianism is a word that has meaning in several disciplines and set off to find the intersection. I spent the early part of the semester getting my students to reflect upon and define intelligence and artificial intelligence, and now I offer this reflection upon utility (or happiness) with respect to intelligent beings and as a short report on my journey into how other academic fields view utility.

The field of Artificial Intelligence (AI), generally considered a subfield of computer science, had its roots in mathematics but intersects with philosophy, economics, neuroscience, psychology, control theory, cybernetics, and linguistics. It is interesting to me that the beginnings of both Artificial Intelligence and utilitarianism coincided with machines. For utilitarianism, it was the Industrial Age and for Artificial Intelligence, the birth of computers. There were earlier contributions, of course, but as a librarian at Webster University said to me, “the writers who seemed to contribute the most to utilitarianism wrote during the Industrial Age.”

In Artificial Intelligence, we study intelligent agents, everything from relatively simple devices to humans. An agent is anything or anybody that can be viewed as perceiving its environment through sensors and acting upon the environment through actuators. [1] It is generally accepted that only living agents have the ability to be happy, whether they are intelligent or sentient or not. In the field of AI, no such assumptions are made. The theory is studied *per se*. Intelligent humans argue about whether robots can be happy or not, although as I note in the beginning, they use the word utility rather than happy. I found this same spirit of study in my limited research into the philosophy of utilitarianism. It is studied for its beauty and usefulness. The scholar in me found that very inviting indeed.

I found a great deal about utilitarianism in philosophy. The well-known philosopher Jeremy Bentham states that “Nature has placed mankind under the governance of two sovereign masters, *pain* and *pleasure*.” [4, page 1] While I found this to be somewhat oversimplifying matters, it did have the appeal of being binary and would be easy to compute.

Bentham goes on to say, “By utility is meant that property in any object, whereby it tends to produce benefit, advantage, pleasure, good, or happiness, (all this in the present case comes to the same

thing) or of mischief, pain, evil, or unhappiness to the party whose interest is considered: if that party be the community in general, then the happiness of the community: if a particular individual, then the happiness of that individual.” [4, page 2] It would seem that happiness and utility are all wrapped up, no matter what or who the agent.

Following Bentham, John Stuart Mill continued the utilitarian tradition and became known as the leader of the “philosophical radicals.” [2] Bentham and Mill are considered to be the most influential contributors to utilitarianism. Even with the wagon-load of books I carried out of the library, I knew I would barely scratch the surface of their important and *very serious* works. There were even many on *science*.

“The creed which accepts as the foundation of morals, Utility, or the Greatest Happiness Principle, holds that actions are right in proportion as they tend to promote happiness, wrong as they tend to produce the reverse of happiness. By happiness is intended pleasure, and the absence of pain; by unhappiness, pain, and the privation of pleasure.” [2, page 6] Volumes of scholarly works have been written on this subject and all of the subjects that arise from it. I found myself wishing I had a year or so just to read them all.

In Herbert Spencer’s book, *Science First Principles*, I found a great deal of the intersection I was seeking. While not specifically discussing utilitarianism, the book divides into two parts: the “Unknowable,” which includes religion and science (and their reconciliation), and the “Knowable,” which, ironically to me, speaks mostly of philosophy. The fact that this struck me as ironic speaks again to my ingrained bias. While I know that the word *philosophy* means the love of knowledge or truth, I have always found more truth (and far less arguing) among scientists and mathematicians than philosophers. This is largely because of our more rigid definition of truth and intends no disrespect to the wonderful and very useful field of philosophy.

There is of course a great deal of intersection among mathematicians, scientists and philosophers. Most of the great ancient Greek philosophers are well-known for their contributions to mathematics and science as well. Bertrand Russell is a more recent example, and Nakhnikian’s book on Russell’s philosophy [7] indicates how deeply academic many of the seemingly simple concepts surrounding mathematics, science and philosophy are.

I wish to thank Corinne Taff for inviting me to reflect on happiness as an academic pursuit after I sent her the quote:

“Because **‘happy’** does not sound very scientific, economists and computer scientists use the term **utility** instead.” [Russell and Norvig, p. 53]

HAPPINESS + MATHEMATICS

My insufficient but revealing journey into the academics of happiness has made me realize how very serious and scholarly a subject it really is. It is the basis for everything. And while I am not sure whether I answered the question in the title, I did learn that utility, which is code for happiness in most references, is a thread that runs through all disciplines, including mathematics and computer science.

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