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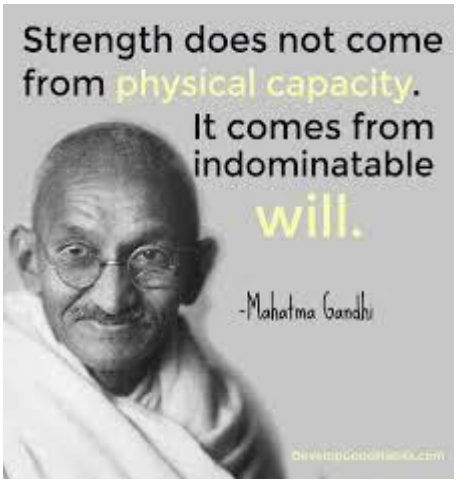


APPLIED SCIENCE AND HUMANITIES DEPARTMENT

VISION

The Department of Applied Science and Humanities is committed to dynamically integrate the components of Science, Humanities and Engineering to groom students to transform them as globally acknowledged professionals.

MISSION

The department is carrying a mission to create and disseminate the knowledge and techniques in intellectual areas of Engineering and other core areas of Applied Science and Humanities for betterment of Eco system.

To inculcate the importance of Applied Science and develop a natural flair for Engineering and Technology which in turn shall mold students into a competent professional.

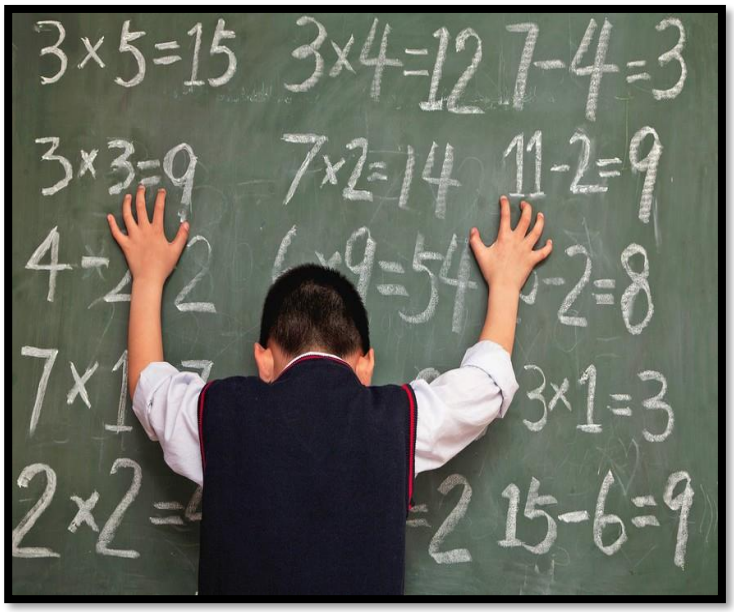
To be recognized for practicing the best teaching-learning processes to create highly competent, resourceful, and self-motivated young Engineers for the benefit of the society.

The Role of Mathematics in Data Science

"Data Science combines different fields of work in statistics and computation in order to interpret data for the purpose of decision making."

The term "science" insinuates that it is a field relies on systematic processes to achieve results that can be tested. The field calls on concepts drawn from Mathematics and Computer Science as the results achieved from such processes can be used for the following problems:

- Recommending a movie for you to watch on Netflix.
- Forecasting company profits
- The price of a house can be predicted as it is measured against features such as: number of rooms, square footage etc.
- Suggesting a song to add to your Spotify playlist



So how does Mathematics fit into this?

Mathematics is particularly important in the field of data science as concepts within mathematics aid in identifying patterns and assist in creating algorithms. The understanding of various notions of Statistics and Probability Theory are key for the implementation of such algorithms in data science. Notions include: Regression, Maximum Likelihood Estimation, the understanding of distributions (Binomial, Bernoulli, Gaussian (Normal)) and Bayes' Theorem.

Machine Learning is a field that focuses on computers having the ability to learn/operate without being programmed to do so. The mathematical concepts noted above are key in understanding/implementing the following Machine Learning techniques:

1. Regression:

Regression is a branch of Statistics that can be used to perform predictions for a given dataset. The types of regression include: Simple Linear, Multiple Linear, Polynomial and Logistic.

I may want to find out the relationship between how long I teach a student in a day and their test scores. I also may want to find out how much my expenditure is affected by my income. We can answer these with regression.

2. Classification:

Classification is a technique employed to assign categories to a collection of data in order to aid in accurate predictions and analysis. With classification algorithms, you are exposed to an existing dataset and are aware of the classes of particular instances; with this knowledge, a predictive model can then be generated to solve the following problem: For each future instance in the dataset, which class does a particular instance belong to. Types of classification algorithms include Max Entropy, K-Nearest Neighbour and Naïve Bayes.

Applications of classification include:

- Determining whether an email is spam or not.
- Determining whether a given image portrays a cat or a dog
- Categorizing videos on YouTube.

In a nutshell, Data Science is used to find/identify patterns, and by having an understanding of various Mathematical notions (some of which are mentioned in this post), patterns can be portrayed in such a way that can be analyzed which is paramount for creating statistical models, algorithms and processes to accurately make decisions.

Contributed by Dr. Teena Trivedi

Creative Thinking

The ICT Academy conducted a 5-day online Fdp on "Creative thinking". I was nominated from the departments to attend this workshop on creative writing. I would like to share a day-wise snapshot of what I learned during these fdp sessions.

Day 1: The facilitator introduced himself and listed the guidelines to be followed for completing the course and receiving the certificate for the same. He began by defining Creativity and how it is different from a seemingly similar concept of Critical thinking.

Day 2: On this day we, the participants were introduced to the term "Chindogu" a Japanese term which refers to invention or discovery that has no practical or productive value to society. Furthermore, we were also acquainted with the tools and factors that help us to be creative which included Culture, habitat, and resources; and 3 pillars of creativity which involved Imagination, Attitude and Knowledge.

Date 3: The chief focus of the day was on problem-solving techniques as most of the creativity begins with an endeavour to find a solution to a problem. He moved on to explain how to analyse a problem using techniques such as mind mapping and SWOT analysis which would help in understanding the problem more deeply. He spoke about using the Cynefin framework that is used to analyse the intensity of the problem.

Day 4: He continued on the need to break down problems and focused on aspects of decision making and again emphasize the importance of using Mind Map and SWOT analysis. He then explained the techniques of using the Six Thinking Hats, a concept given by the psychologist Edward Bono, which are six perspectives of looking at the problem before taking the final decision.

Day 5: On the final day he summarised all the concepts discuss discussed during the last four days of the faculty development program and give some tips to improve our ability to be creative.

All the sessions were very interactive and were conducted in a very friendly way. The sessions were enlightening and exceedingly informative. I am heartily grateful to my department for having given me this opportunity to develop my skills in the aspect of creativity.

Contributed by Ms. Marina Thomas

The world's first carbon dioxide removal law database

Researchers at Columbia University recently launched the world's first on database of carbon dioxide removal laws. The database, which is publicly available at **cdrlaw.org**, provides an annotated bibliography of legal materials related to carbon dioxide removal and carbon sequestration and use. The site has 530 resources on

legal issues related to carbon dioxide removal, including such techniques as: direct air capture; enhanced weathering; afforestation/ reforestation; bioenergy with carbon capture and storage; biochar; ocean and coastal carbon dioxide removal; ocean iron fertilization; and soil carbon sequestration. The database also

includes 239 legal resources on carbon capture and storage, utilization, and transportation.

This site was created by the Sabin Center for Climate Change Law at Columbia Law School, in cooperation with the Carbon Management Research Initiative at the Center on Global Energy Policy at Columbia's School of International and Public Affairs. Generous financial support was provided by the ClimateWorks Foundation and the Earth Institute at Columbia University.

"All scenarios for achieving the Paris temperature targets include not only a rapid transition away from the use of fossil fuels, but also the removal of large quantities of carbon dioxide from the atmosphere, and the capture and sequestration or use of carbon dioxide from those industrial sources whose emissions cannot otherwise be prevented. This resource assembles in one place the legal analyses of the relevant technologies, and will aid in the development of the needed laws and regulations," said Michael Gerrard, a professor at Columbia Law School and faculty director of the Sabin Center for Climate Change Law.

"This new and vital web resource on CO_2 removal and carbon management augments the extraordinary legal work of the Sabin Center o n Climate Law. The new portal serves scholars, advocates, governments, and companies large and small by providing clear and straightforward access to best-in-class scholarship on how the abundant natural resources of the world can reduce and repair the harm of human-caused climate change in a just and equitable way. This effort provides legal insight to the climate counterstrike," said Julio Friedmann, a senior research scholar at the Center on Global Energy Policy who leads the Carbon Management Research Initiative.

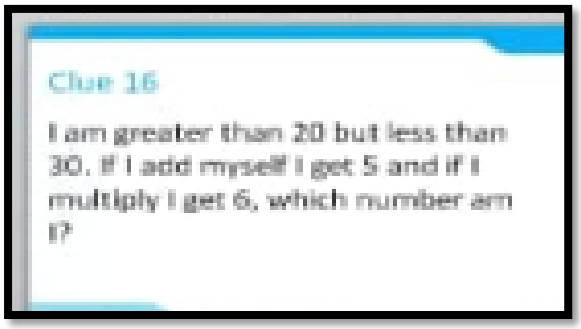
The Sabin Center is also undertaking a series of white papers with in-depth examinations of the legal issues in particular carbon dioxide removal technologies.

By Earth Institute at Columbia University
Source: https://phys.org/news/2020-10-world-carbon-dioxide-law-database.html
Compiled by Marina Thomas

Technical Housie -Engineer's Day Celebration.

The Department of applied Science and Humanities contributed to the Engineering Day on 15 September 2020 by conducting a fun activity, the Technical Housie. Mrs. Neha Shah, Dr. Teena Trivedi, Mr. Masiyuddin Khan, Mr. Kamlesh Tiwari and Mr. Aniket Patil convened the event.

The competition was similar to Housie but with a technical flavour. Participants were asked to prepare their own ticket as per description given to them. Breaking from the conventional way of calling out numbers, clues were provided instead, and participants were required to guess the numbers based on the clue and strike out the numbers from their personalized



tickets if they existed. Event was conducted on Google meet platform (virtual mode) and 74 students participated in the event. There were 179 as audiences and cheered the participants. The event was thoroughly enjoyed by Faculty members and students a like

Contributed by Mrs. Neha Shah

An interesting Information…..

Why is there a green and orange dots on i-phone?

In September, Apple officially released its iOS 14 software update, and since then iPhone users have decked out their home screens with widgets, and lots of people have wondered what's up with those green and orange dots at the top of their screens.

The answer…

- Apple's new iOS 14 update comes with a slew of new privacy features, including a "recording indicator" that shows when an app has access to your mic or camera.
- It's a step toward better app transparency, so users can be more proactive with their permissions.

The green dot means the app you're using can access the camera, while the orange dot means the app can access your microphone.

Edited and Compiled by Marina Thomas

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