A.V.C COLLEGE OF ENGINEERING, MANNAMPANDAL, MAYILADUTHURAI

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Department of Electronics and Communication Engineering

"LEMON NEWSLETTER"

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Message from Head of the Department

I wish the faculty to show their fullest cooperation in conducting the online classes for the students

I expect the students to participate in the online webinars and conferences and improve their career.

I wish faculty members to attend more online webinar and faculty development programmes to guide the students in devepoping their knowledge.

Dr.S.SIVANESSKUMAR

HOD/ECE

Positive Quotes

"No one is perfect - that's why pencils have erasers."

"You're off to great places, today is your day. Your mountain is waiting, so get on your way."

"You always pass failure on the way to success."

Faculty Corner:

SOPHIA- HUMANOID ROBOT

- ***Mrs.K.R.Vinothini,AP/ECE***

Sophia is a social humanoid robot developed by the Hong Kong-based company Hanson Robotics. Sophia was activated on February 14, 2016, and made her first public appearance in mid-March 2016 at South by Southwest (SXSW) in Austin, Texas, United States.

Sophia has been covered by media around the globe, and has participated in many high-profile interviews. In October 2017, Sophia was given Saudi Arabian citizenship, and became the first robot to receive citizenship of any country. In November 2017, Sophia was named the United Nations Development Programme's first Innovation Champion, and is the first non-human to be given a United Nations title.

Sophia was first activated on February 14, 2016. The robot, modeled after the ancient Egyptian Queen Nefertiti, Audrey Hepburn, and its inventor's wife, Amanda Hanson, is known for its human-like appearance and behavior compared to previous robotic variants. As of 2018, Sophia's architecture includes scripting software, a chat system, and OpenCog, an AI system designed for general reasoning. Sophia imitates human gestures and facial expressions and is able to answer certain questions and to make simple conversations on predefined topics (e.g. on the weather).

Sophia uses speech recognition technology from Alphabet Inc. (the parent company of Google) and is "designed to get smarter over time". Its speech synthesis ability is provided by CereProc's text-to-speech engine, and also allows it to sing. Sophia's intelligence software is designed by Hanson Robotics. The AI program analyses conversations and extracts data that allows it to improve responses in the future.

Hanson designed Sophia to be a suitable companion for the elderly at nursing homes, or to help crowds at large events or parks. He has said that he hopes that the robot can ultimately interact with other humans sufficiently to gain social skills. Sophia is marketed as a "social robot" that can mimic social behavior and induce feelings of love in humans.

Sophia has at least nine robot humanoid "siblings" who were also created by Hanson Robotics. Fellow Hanson robots are Alice, Albert Einstein Hubo, BINA48, Han, Jules, Professor Einstein, Philip K. Dick Android, Zeno, and Joey Chaos. Around 2019–20, Hanson released "Little Sophia" as a companion that could teach children how to code, including support for Python, Blockly, and Raspberry Pi.

Sophia has been interviewed in the same manner as a human, striking up conversations with hosts. Some replies have been nonsensical, while others have impressed interviewers such as *60 Minutes*'s Charlie Rose In a piece for CNBC, when the interviewer expressed concerns about robot behavior, Sophia joked that he had "been reading too much Elon Musk.

Business Insider's chief UK editor Jim Edwards interviewed Sophia, and while the answers were "not altogether terrible", he predicted that Sophia was a step towards

"conversational artificial intelligence".At the 2018 Consumer Electronics Show, a BBC News reporter described talking with Sophia as "a slightly awkward experience".

On October 11, 2017, Sophia was introduced to the United Nations with a brief conversation with the United Nations Deputy Secretary-General, Amina J. Mohammed. On October 25, at the Future Investment Summit in Riyadh, the robot was "granted Saudi Arabian citizenship", becoming the first robot ever to have a nationality, described as a publicity stunt. This attracted controversy as some commentators wondered if this implied that Sophia could vote or marry, or whether a deliberate system shutdown could be considered murder. Social media users used Sophia's citizenship to criticize Saudi Arabia's human rights record.

Student Corner:

PRINTING PLASTIC SOLAR CELLS

- ***M.Atchaya, IV ECE***

Scientists recently found a new way to make solar panels: by printing them! Most people think about printing things like books, but we can also use a special kind of printers to print objects made out of plastics. Plastics are made of polymers, which are very long molecules. Under a very strong microscope, polymers look like cooked spaghetti, but, in fact, they are a million times smaller. To print plastics, you simply replace the cartridge in your printer at home with "plastic ink." The plastic ink is a combination of two polymers dissolved in a liquid. When printed, the liquid dries and the two polymers form a thin film. For solar cells, we use a special type of polymer that can convert sunlight into electricity.

Plastic solar cells can be printed on large rolls of flexible foil. Recently, 100 m-long solar panels were printed . Using these cheap solar panels, only around 1.5% of the energy in the sunlight is converted to electricity. This efficiency is still low compared to the expensive solar panels you can buy now, which can convert 15–20% of the sun's energy into electricity. But the future looks bright. In laboratories around the world, small plastic solar cells are already being made with much higher efficiencies, up to about 12% .One of the tricks to increase the efficiency is adding a special additive_ to the plastic ink before printing. This special additive was found by accident, but if we want to improve the efficiency of the plastic solar panels even further, we need to know why this special additive works. Understanding how plastic solar cells work is not easy. Many scientists have worked on this topic for years. As background, we explain the most important findings in the next two paragraphs, but if you feel that you are more eager to learn about the secrets of the special additive you can skip these paragraphs and read about our investigations and our results further on.

HOW DO PLASTIC SOLAR CELLS CHANGE LIGHT INTO ELECTRICITY?

To answer this important question, we have to look how plastic solar cells are made. Plastic solar cells consist of a plastic layer on glass or a flexible foil. In the lab, we use glass plates with a transparent electric contact [the positive (+) pole]. On top of this contact, we put the ink for the , which is the part of the solar cell that converts sunlight to electricity. This ink contains two polymers, a long green one and a shorter red one.

The polymers form a mixed layer, as shown in Figure 1. On top of that layer, we put a metal layer, which functions as the negative (−) pole. We then turn the whole stack of layers upside down such that sunlight can shine through the glass into the active layer.

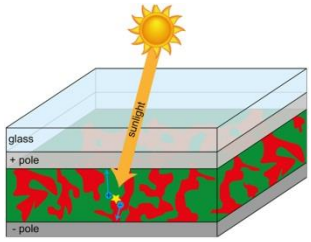


Figure 1 - Diagram of a plastic solar cell.

Sunlight creates a plus (+) and a minus (−) charge at the interface between two polymers. The (−) charge moves to the (−) pole of the solar cell and the (+) charge to the (+) pole. These poles work just like those in a battery, but are powered by the sun and never run out as long as the sun shines.

The drawn structure of red and green polymers in Figure 1 is exactly what we want! There is a lot of interface , or area of contact, between the two polymers. This is necessary, because sunlight creates electrical charges only at the areas where the two polymers are in contact. When the light is absorbed (the yellow star), positive (+) and negative (−) electrical charges are generated. Normally, the + and − attract each other and the energy is lost. In plastic solar cells, the red and green polymers make sure the charges can be separated. The positive and negative charges then move to the + and − poles. Now, light is converted to moving charges, which is electricity! Think about how useful this is – we use free sunlight and two cheap plastics to make electrical energy!

CAN WE SEE THESE SMALL POLYMERS?

The green and red polymers are so small that we cannot see them easily, even when using a normal microscope. But we can see them with an microscope, which does not use light, but electrons to "look" at the solar cells. In Figure 2, we show electron microscopic images of real plastic solar cells. These are images looking down on the active layer. The two polymers show up as dark and bright areas and not as red and green because electrons are "colorblind." On the left, a poorly working plastic solar cell is shown. The large droplets create very little interface and the efficiency is low: 1.5%. On the right, a much better plastic solar cell is shown. The structure between dark and bright areas is now so small that it is actually hard to see, but it means that there is a lot of interface.

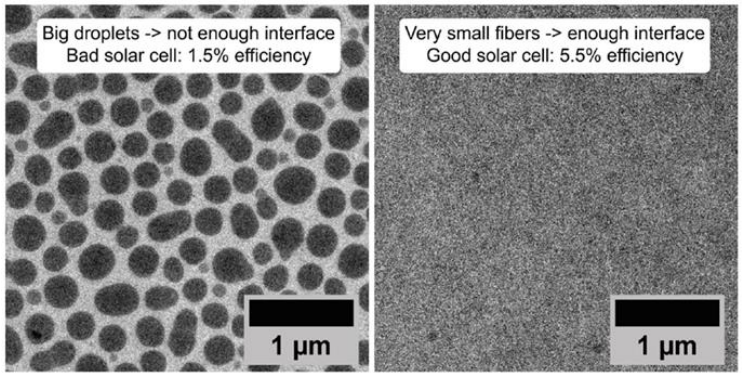


Figure 2 - Top view microscopic image of a bad solar cell (left) and a good solar cell (right), taken with an electron microscope.

Remember that we are looking at very small things: the length of the scale bar is one millionth of a meter (about 3 millionth of a foot). The scale bar would fit 100× in the width of a human hair! The big droplets in the image on the left have little interface between the two polymers, which is bad for solar cell efficiency. The image on the right has very small fibers, which create a large interface between the two polymers, which is good for solar cell efficiency.

Questions on Digital Communication –Interpolation

- P.Aishwarya ,IV ECE

1. Interpolation is done by
   a) Curve fitting
   b) Regression analysis
   c) Curve fitting & Regression analysis
   d) None of the mentioned
2. Interpolation provides a mean for estimating functions
   a) At the beginning points
   b) At the ending points
   c) At the intermediate points
   d) None of the mentioned
3. Interpolation methods are
   a) Linear interpolation
   b) Piecewise constant interpolation
   c) Polynomial interpolation
   d) All of the mentioned
4. Linear interpolation is
   a) Easy
   b) Precise
   c) Easy & Precise
   d) None of the mentioned
5. Error is equal to
   a) Distance between the data points
   b) Square of the distance between the data points
   c) Half the distance between the data points
   d) None of the mentioned
6. Which produces smoother interpolants?
   a) Polynomial interpolation
   b) Spline interpolation
   c) Polynomial & Spline interpolation
   d) None of the mentioned
7. Which is more expensive?
   a) Polynomial interpolation
   b) Linear interpolation
   c) Polynomial & Linear interpolation
   d) None of the mentioned
8. Gaussian process is a _____ interpolation process.
   a) Linear
   b) Non linear
   c) Not an interpolation process
   d) None of the mentioned
9. Interpolation means
   a) Adding new data points
   b) Only aligning old data points
   c) Only removing old data points
   d) None of the mentioned
10. Interpolation is a method of
   a) Interrelating
   b) Estimating

c) Integrating
d) Combining

Answers:

1. c) Curve fitting & Regression analysis
2. c) At the intermediate points
3. d) All of the mentioned
4. a) Easy
5. b) Square of the distance between the data points
6. c) Polynomial & Spline interpolation
7. a) Polynomial interpolation
8. a) Linear
9. a) Adding new data points
10. b) Estimating

Hard Logic Puzzles

- ***Indhu. M, III ECE***

1. Logic Puzzle: Susan and Lisa decided to play tennis against each other. They bet $1 on each game they played. Susan won three bets and Lisa won $5. How many games did they play?

Answer: Eleven. Because Lisa lost three games to Susan, she had lost $3 ($1 per game). So, she had to win back that $3 with three more games, then win another five games to win $5.

2. Logic Puzzle: If five cats can catch five mice in five minutes, how long will it take one cat to catch one mouse?

Answer: Five minutes. Using the information we know, it would take one cat 25 minutes to catch all five mice (5×5=25). Then working backward and dividing 25 by five, we get five minutes for one cat to catch each mouse.

3. Logic Puzzle: There is a barrel with no lid and some wine in it. "This barrel of wine is more than half full," says the woman. "No, it's not," says the man. "It's less than half full." Without any measuring implements and without removing any wine from the barrel, how can they easily determine who is correct?

Answer: Tilt the barrel until the wine barely touches the lip of the barrel. If the bottom of the barrel is visible then it is less than half full. If the barrel bottom is still completely covered by the wine, then it is more than half full.

4. Logic Puzzle: There are three bags, each containing two marbles. Bag A contains two white marbles, Bag B contains two black marbles, and Bag C contains one white marble and one black marble. You pick a random bag and take out one

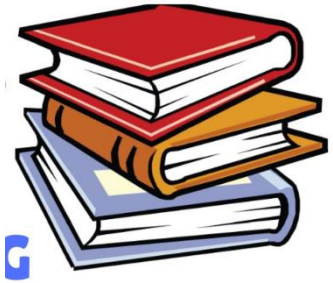
marble, which is white. What is the probability that the remaining marble from the same bag is also white?

Answer: 2 out of 3. You know you don't have Bag B. But because Bag A has two white marbles, you could have picked either marble; if you think of it as four marbles in total from Bags A and C, three white and one black, you'll have a greater chance of picking another white marble.

Editors Desk

Benefits of Reading Books: How It Can Positively Affect Your Life

- *Strengthens the brain.*
- *Increases empathy.*
- *Builds vocabulary.*
- *Prevents cognitive decline.*
- *Reduces stress.*
- *Aids sleep.*
- *Alleviates depression.*
- *Lengthens lifespan.*



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Vision of the Institute

To blossom into a cynosure of technological innovations

Mission of the Institute

To participate in the noble cause of nation building by offering professional education, research and training in engineering and technology especially to the rural based poor Students

Department Vision

To create globally competent engineers in Electronics and Communication Engineering to meet the industrial progress for betterment of the society

Department Mission

1. To create an academic ambience for quality education in the field of Electronics and Communication Engineering
2. To make the best use of modern tools and software for teaching and research activities
3. To promote industry-institution interaction for skill-based learning of students from rural society
4. To inculcate moral and ethical values with a sense of professionalism.

PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: To enable graduates to pursue research, or have a successful career in academia or industries associated with Electronics and Communication Engineering, or as entrepreneurs.

PEO2: To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build solutions or systems of varying complexity.

PEO3: To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified.

PROGRAMME OUTCOMES:

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

1. To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering.
2. To apply design principles and best practices for developing quality products for scientific and business applications.
3. To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel problems.