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HUMAN COMPUTER INTERACTION IN EVERYDAY LIFE BY USING DEEP LEARNINIG

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ABSTRACT

Human Computer Interaction (HCI) is the design and implementation of interactive computing systems that users can interact with. It includes desktop systems in different devices. Success of a technology simply results from the easiness with which the user can interact with it. A simple and easy way to use a system doesn't mean that a simple technology is behind such a system. The most important concepts in HCI are functionality and usability. Usability is when a user utilizes the system's functions easily, properly and clearly. Functionality and usability may vary from one system to another.

In this project we interact with computer by using deep learning. HCI spread through various everyday human activities, transforming the way we communicate, learn and entertain ourselves. With the help of this project we explores the impact of smartphones, tablets and wearable devices on personal productivity and communication.

Keywords: Human Computer Interaction, Machine Learning, Sensor, User Interface Design.

I. INTRODUCTION

Human-Computer Interaction (HCI) is about making computer stuff easy for people. It means designing computer screens and gadgets so that they are simple to use and understand. HCI experts also check if these things work well for people. They think about how people use computers in everyday life and how it affects them. They use what we know about how our brains work with computers to make things better. They also make sure the things on our screens look good and are easy to read. So, HCI is all about making computers and people work together nicely.

Human-computer interaction (HCI) has been considered as computer-related cross-disciplinary domain that is strongly associated with design for information, interaction, and communication and technology. Human-Computer Interaction (HCI) is all about making it easy for people to use computers. It is about the relationship between a human and a computer, their mutual understandings. HCI experts study how humans and computers work together and design software that people find easy and enjoyable to use. This involves making computer screens and buttons that make sense, as well as listening to what users like and don't like. HCI also looks at how computers can understand and respond to human, which is important for making technology more user-friendly. Overall, HCI aims to make computers and technology friendlier and more helpful for everyone.

Human-computer interaction through hand gestures has become a fundamental part of our daily lives, transforming how we engage with technology. Public spaces often feature interactive displays responsive to hand gestures, providing easy access to information and services. Hand gestures are also finding applications in sign language recognition, offering improved accessibility for individuals with hearing impairments. As technology continues to develop, hand gestures play an ever-expanding role in making our interactions with computers. The Human computer interaction in everyday activities has two phases. The first phase is to capture the activity made by human and the second phase is to give the message about which activity is made by human.

As technology continues to progress and gesture recognition systems become friendly, hand gestures are confident to play an even more fundamental role in our everyday lives. They make interactions with computers and technology more intuitive, efficient, and accessible, fundamentally reshaping how we engage with and control the digital world around us.

Human:

In Human-Computer Interaction (HCI), humans occupy a central and multifaceted role. They are the end-users who interact with computers and technology, offering input through various means like keyboards,

touchscreens, and voice commands. Users provide invaluable feedback during usability testing, helping to refine and improve interfaces. They adapt to new technologies, acquire skills, and make choices about software and configurations that suit their needs. Some users create content or customize interfaces, contributing to their digital environments. HCI's core principle revolves around understanding and accommodating the needs, preferences, and behaviors of users, with humans at the heart of the interaction process.

COMPUTER

The computer in HCI stands as the linchpin, facilitating the intricate interplay between humans and the digital realm. Its design, capabilities, and performance profoundly shape the user experience and the efficacy of human-computer interactions. HCI researchers and designers continually strive to optimize the computer's role, aiming to create technology that is user-centric, efficient, and harmonious with human needs and expectations.

INTERACTION

Human–computer interaction (HCI) is research in the design and the use of computer technology, which focuses on the interfaces between people human and computers.

Purpose of the Project:

Human-Computer Interaction (HCI) is like the bridge that connects people and computers, enabling smoother and more effective interactions between humans and technology. Imagine your hand as a representation of HCI: it plays important role in shaping how we engage with computers. The fingers on your hand represent various aspects of HCI's purpose. One finger stands for usability, making sure that using computers is easy and efficient. Another finger symbolizes enhancing the user experience, that is enjoyable and engaging. Accessibility, represented by another finger, ensures that everyone, regardless of abilities, can use computers. Efficiency and productivity are the next finger, making tasks quicker and more straight forward. Ethical considerations, our final finger, ensure technology respects your rights and values. Just as each finger on your hand has a role, HCI's purpose is to integrate these aspects to create technology that's user-friendly, inclusive, efficient, customizable, and ethical, ultimately improving how we interact with computers in our daily lives.

Objective:

The intention of this subject is to learn the ways of designing user-friendly interfaces or interactions. Considering which, we will learn the following –

- Ways to design and assess interactive systems.
- Ways to reduce design time through cognitive system and task models.
- Procedures and heuristics for interactive system design.

Firstly in our project we can interact with computer by the help of our sign and gesture. we can create this project by the help of python. In our project computer understand our gesture and after that computer reply on it.

Suppose we interact with computer in various field like, humans say hello to computer then computer instant reply on it the computer reply on it by the help of display message on screen. In our project is also helpful for disable person suppose one disable person is there and he say that to computer any type of massage by the help of gesture and computer instant replay on it. This all type of activity do computer in our project. Shorty in our project humans interact with computer with the help of our gesture and also with the help of our sign and then computer understand our activity and then instant replay on it by the help of display massage on it. In our project all activity do in Real time....

Goal of our project is: Real time interaction computer and humans.

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II. LITERATURE REVIEW

Author(s)	Discipline(s) reviewed	Keywords used to identify papers for review	Number of papers reviewed	Process of finding the papers
Agrawal et al.	HCI and IS	HCI, computer-mediated communication, and literature review	32	EBSCO and publisher databases were used with keyword search to identify appropriate papers
Akoumianakis and Stephanidis	HCI and universal design	Namely, guidelines, user interface development frameworks and architectures, user interface software technologies, and support actions	N/A	N/A
Aryana and Øritsland	HCI and science	Culture, mobile HCI, design, and review	40	Concept-matrix, which make category with presented conceptsof papers was used
De Almeida Neris et al	Sustainability and HCI	Sustainability, systematic review, and HCI	51	Systematic review was applied to discover relative papers of a research question
Eng et al.	Engineering design	Hypermedia, graph, diagram, complexity, design flow, and visual literacy	N/A	Qualitative perspective with mixed methods like observation and interview was considered to gather relative papers
Insfran and Fernandez	Usability evaluation	Usability evaluation methods, web development, and systematic review	51	Systematic review was applied to discover relative papers of a research question
Kjeldskov and Paay	HCI and interaction design	Research methods, research purpose literature survey, introductory and survey, design, and human factors	55	The literature survey method was adopted
Hayes and Games	Computer software, computer games, education,and design thinking	Video games, learning, thinking, game design, and software	N/A	N/A

III. METHODOLOGY

Multidisciplinary Approach:

HCI is a multidisciplinary field, meaning it incorporates research methods from various disciplines to gain a comprehensive understanding of human-computer interactions.

User-Centered Design:

User-centered design is a significant approach in HCI. It involves actively engaging users to understand their needs and tasks, then iterating the design and evaluation process based on their feedback.

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Common User-Centered Design Methods:

Some frequently used methods in user-centered design include field studies (observing users in their natural environment), gathering user requirements, iterative design (making continuous improvements based on user feedback), usability evaluation (assessing how user-friendly a system is), task analysis, focus groups, heuristic evaluations (experts assessing system usability based on predefined criteria), user interviews, prototype testing (testing early versions of a product with users), surveys, informal expert reviews, card sorting (organizing content based on user preferences), and participatory design (involving users in the design process).

User Research:

User research techniques add context and insights to the design process. Researchers carefully analyze their findings, identify patterns, and use both quantitative and qualitative methods to gather data. While quantitative methods involve numerical data, HCI research often leans toward qualitative methods, which focus on understanding users' experiences and perspectives.

Technology:

1. Graphical User Interfaces (GUIs): A graphical user interface, or GUI, is like the front part of your computer or phone. It uses pictures, buttons, and menus to help you do things on your device. Instead of typing or reading a lot, you can just click on pictures or buttons to make your computer do what you want. It's like using pictures and symbols to talk to your device, which makes it much easier for you to use. So, GUIs are the colorful and visual way to interact with your computer or phone.

2. Touchscreen Technology: Touchscreens, the screens you can touch on smartphones and tablets, let you do things on these devices by tapping, swiping, and pinching your fingers. This makes it easier and more enjoyable for you to use them. A touch screen digitizer is a special glass layer on your smartphone or tablet that changes your finger's touch into signals the device can use. It sits on top of the screen you see and is present in both capacitive and resistive touch screens.

3. Voice Recognition: Voice recognition technology, like Siri and Alexa, lets you talk to your computer and devices instead of typing or pressing buttons. It makes it easier for people to use them, and it feels more like having a conversation with your devices.

4. Gesture Recognition: Gesture-based interaction, which you might have seen with devices like Microsoft Kinect or VR controllers, allows you to control and change digital stuff using your body movements and gestures.

5. Augmented Reality (AR) and Virtual Reality (VR): AR and VR technologies make your computer interactions feel really immersive. With AR, you see digital stuff on top of what's around you in the real world. With VR, you're in a whole virtual world that's not real, but it feels like you're really there.

6. Haptic Feedback: Haptic technology is all about making you feel things through touch. For example, when you play games, your controller can vibrate or push back a bit, so you can feel what's happening in the game. It's like adding a sense of touch to how you interact with computers.

7. Eye-Tracking: Eye-tracking technology lets computers know where you're looking, so they can do things based on that. This is useful in things like games and tools that help people with special needs. It's like your computer understanding where your eyes are focused and reacting accordingly.

8. Biometric Authentication: Fingerprint and facial recognition are ways to make sure that only you can access certain things, like your phone or computer. They're easy to use because you just need your fingerprint or face, and they're also very secure.

9. Machine Learning and AI: AI-powered systems like chatbots and recommendation tools make your computer interactions more personal and can do things for you automatically. Machine learning, which is a part of AI and computer science, is all about using data and special math to make computers learn and get better at what they do, a bit like how people learn and get better over time.

10. Accessibility Tools: Assistive technologies, like screen readers that read aloud text and special input devices, are really important for making computers easier to use for people with disabilities. They help these individuals access and interact with technology.

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11. Natural Language Processing (NLP): NLP technologies help computers understand and talk back to us like humans do. They make chatbots and talking to computers in conversations possible.

MODEL

Norman's Model of Interaction:

Norman is studying how people use technology in their daily lives, and he breaks it down into two main parts:

- Deciding what you want to do: This is where you figure out what you want to accomplish with the technology.
- Planning how to do it: Once you know what you want to do, you come up with a plan for how to make it happen.
- Taking the action: This is when you actually put your plan into action and do what you intended to do.
- Carrying out the plan: Now, you put your plan into action and do what you intended to do.
- Seeing what happens after your action: After you've done something, you check out what's going on in the world around you.
- Understanding what you see: You try to make sense of what's happening and what you're observing.
- Deciding if your goal was met: Finally, you determine if you achieved what you set out to do or if you need to adjust your plans.

The Interaction Model:

Abowd and Beale compare interaction with a computer to translating between different languages. They break it down into four parts, each with its own language:

- User: This is what you want to do or tell the computer.
- Input: It's how you communicate your wishes to the computer.
- System: This is what the computer does with your request, like processing it.
- Output: It's how the computer replies or responds to what you asked or did.

Structure of HCI (Human-Computer Interaction):

- HCI involves three main things:
- The User: This is the person using the computer. What they're like and what they know is important because it affects how they use the computer.
- The Computer: This covers all kinds of technology, not just regular computers. It includes everything from big computers to small gadgets that can do things with information.
- The Interaction: This is how the user and the computer team up to get stuff done. It's all about the different ways people talk to and work with technology.

IV. CONCLUSION

- HCI is growing in importance as the number of people who interact with computers grows.
- The explosive growth of the Internet and of e-commerce has served to focus attention on the usability of websites as yet another kind of computer interface.
- By prioritizing user-centered design, accessibility, and ethical considerations, we can create a future where technology enhances the human experience, fosters inclusivity, and empowers individuals to interact with computers in meaningful and impactful ways.

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