
SYMBIOSIS INSTITUTE OF TECHNOLOGY

SYMBI SAINS

Annual Departmental Magazine of Computer Science and Engineering



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THE EDITORIAL

Symbi-Sains, the CSE departmental magazine, welcomes you! Our magazine symbolizes our students' and faculty's collaborative endeavour to construct a better world through technology. We provide you with the most recent trends and insights in Computer Science and Engineering with each publication. We seek to enlighten and inspire you with cutting-edge research and thought-provoking opinion articles.

We hope to develop a platform for collaboration, innovation, and idea exchange through Symbi-Sains. It is a place where students and faculties can showcase their talents, discuss their experiences, and contribute to our department's ever-expanding knowledge base.

The field of computer science and engineering has enormous potential to change the world. Let us take this moment and make a difference together. Explore the pages of Symbi-Sains to pique your interest, spark your enthusiasm, and equip yourself to become a future leader. Join us as we use technology to pave the route to a brighter future.

Happy reading !!



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THE EDITORIAL TEAM



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VISION AND MISSION

THE VISION

To evolve as a centre of excellence in Computer Science and Engineering to produce skilled and proficient global professionals to build the society.

THE MISSION

- To provide the conducive environment for establishing students in the global platform of research and innovation
- To educate students on cutting edge technologies with problem-solving capabilities, leadership and team work skills
- To inculcate the professional values with lifelong learning through curricular and co-curricular activities and create globally-aware disciplined citizens.
- To commence various initiatives for motivating students to work for the betterment of society.

PROGRAM EDUCATIONAL OBJECTIVES

- PEO1: Apply their skills with research orientation and establish themselves globally.
- PEO2: Apply problem solving and emerging technology skills for designing solutions .
- PEO3: Apply technical and leadership skills to be a successful entrepreneur.

FROM THE DIRECTOR'S DESK

Welcome to the Department of Computer Science Engineering, where you'll join a diverse community engaged in hands-on learning and cutting-edge research on your route to a successful career in business, government, or academia. Through creative instruction from our professors and involvement in hands-on projects and laboratories, our undergraduate and postgraduate students get an excellent educational experience.



DR. KETAN KOTECHA

Being a member of one of our student competition teams allows you to acquire not just engineering and interpersonal abilities but also lifelong friendships. Working on industry-sponsored capstone projects and internships in businesses fosters professional ties that lead to post-graduation success.

Our faculty members are engaged in high-impact research funded by government and academic bodies in a variety of areas, including Artificial Intelligence and Machine Learning, Deep Learning, Cyber Security, Blockchain, and Data science.

Through excellence in teaching, research, and service, we create an inclusive and dynamic experience. Welcome, I look forward to working with you. If you have any comments, questions, or ideas, please email me at director@sitpune.edu.in.

DR. KETAN KOTECHA

Professor, Computer Science & Engineering

Director, Symbiosis Institute of Technology

Head, Symbiosis Centre for Applied Artificial Intelligence

(SCAAI)

FROM THE DEPARTMENT HEAD'S DESK

Welcome to the Department of Computer Science and Engineering (CSE) at Symbiosis Institute of Technology, Pune. Computer science Engineering is a fascinating, challenging, and dynamic discipline that is now generally acknowledged as a vital source of tools and strategies for improvements in virtually every field of human effort. The Department of CSE started its journey in 2008 by offering undergraduate and postgraduate programs. Currently, the Department has a total of 29 skilled full-time faculty members with many of them being PhD degree holders. The Department's facilities include cutting-edge classrooms and programming laboratories, each with the most up-to-date machines and equipment.

Department of CSE at SIT is intensively research-oriented and student-centered. Our mission and vision statements express some of our department's guiding concepts and objectives. You will be exposed to high-quality inspiring teaching and learning as a student in the Department. You'll get the chance to work on real-world issues presented by the industry, learn from IT & international experts/researchers. Students can enhance their experiences and grow personally by participating in and organizing extracurricular activities such as the technical events, hackathons, poster presentations, conferences, student clubs, and other activities that promote the development of a variety of both discipline-specific and lifelong transferable skills such as enterprise, collaboration, and leadership.

We are quite proud of our graduates and their achievements; they are highly competent IT professionals who are pursuing successful professions in a variety of settings in a competitive and global market. If you have any comments, questions, or ideas, please email me at headcsit@sitpune.edu.in.



DR. DEEPALI VORA

DR. DEEPALI VORA
Professor & Head,
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ARTICLES

THE SIMULATION HYPOTHESIS

-SAROTHI ADHIKARY

Imagine you were walking alone on a street. A man walks by and waves at you. Being a good-natured person, you wave back at him. You keep on moving, when suddenly you see the same man walking past you. He again waves at you, and you wave back. Coincidence maybe? You keep on walking when the person appears a third time, but this time you do not wave back. You feel a tingling sensation in your head. You feel the sun's warmth on your body, but it's not coming from an orb of hot, gas floating 90 miles from you. You see a dog bark at you, but the sound wasn't made by a dog at all. You breathe in oxygen, filling up your lungs, but how do you know any of it is real? We can never truly confirm it. We have been fed up information since we were born, but what if things are not what it seems. What if.... What if we are not all humans at all but just a few lines of computer code.

This is the basis of the Simulation Hypothesis which states that the physical world we live in, including the Earth and the universe as a whole, is actually a part of a computer simulation.

This is not a joke, and by no means is it a new idea. Some scientist and philosophers, around the world believe that we are all part of a computer simulation. They believe what we see, is not actually real but just something our brain wants us to see. This idea stretches all the way back to ancient philosophy where Plato, one of the classical Greek philosophers, argued that



even with our superior knowledge, we aren't truly observing anything. He wrote his conclusions in the allegory of caves. He described a story where, a number of people were chained in a dark cave, where they could only see the shadows of themselves on the wall in front of them. Never being outside the case, these people assumed these shadows to be their reality. But one day, a prisoner broke free from his chains and looked away from the shadow and as he glimpsed the outside world, he realized that what he was seeing was merely a shadow.

Some aspects of the world could be explained by the simulation hypothesis. The author of the book *The Simulation Hypothesis*, Rizwan Virk says, "Simply because we perceive the world as 'real' and 'material' doesn't mean that it is so," For example, findings of quantum mechanics doubt on the fact, whether the world is real or not. The more the scientists, searched for some 'material' in this material universe,

universe, the more they understood that it simply does not exist. Another example is that of the Schrödinger's Cat which states that if we leave a cat in a box with some radioactive material, then there is a 50% chance that the cat is alive and a 50% chance that the cat is dead. Now, by common sense we can tell that opening the box would reveal the answer, but quantum physics considers the cat to both be alive and dead at the same time in the box, until someone opens it. The gist of this example, is that the universe only renders what needs to be observed.

Brain spinning yet? Don't worry you will get used to it.

So who is this mystery puppeteer who, controls us? There are many answers to such a question, but the most common one is, that somehow the future humans have become so advanced that they were able to create simulations of past versions of the world. Just like in the Black Mirror episode where people from distant future could enter a simulation of the 1980s, we are actually just past versions of people. We are the accurate replica of their past before the simulation was invented.

But this introduces another question. Why? Why create a computer simulation of the past? Fans of the popular movie Matrix, believe that the simulation may be a result of a lost battle between humanity and AI where the AI realized that it needs humans to act as a power source. In an effort to keep us chained down, the AI has put us inside a simulation. This would be the perfect way to imprison us. It would seem like everything is normal, even if the real world has turned into an apocalyptic wasteland.

Some believe that the Simulation is like a video game like the popular video game Sims. We may be part of some advanced being form of enjoyment. A simple escape into the old world.

You might ask, "So what if we are a part of simulation. How does it help". The broad answer, according to Rizwan Virk, is that it helps to understand what all good science pursues: truth. More specifically, our truth. If we do in fact exist inside a video game, then wouldn't it be better to know what kind of game we are in to increase our chance of survival?

The answer is an unqualified **YES**.

THE EXCITING WORLD OF HUMAN-COMPUTER INTERACTION

-TUSHAR SHARMA

Human-Computer Interaction (HCI) is the study of how people interact with digital devices, and how to design interfaces that are easy to use and efficient. It's a rapidly evolving field that is full of fascinating examples of innovation and creativity.

One of the most mind-blowing examples of HCI is the Google Translate app. This app uses machine learning algorithms to provide accurate translations of text, images, and even speech in real-time. The interface is simple and intuitive, with a clean design that makes it easy to use. This technology has revolutionized the way people communicate across different languages, and has made the world a smaller and more connected place.



Another exciting example of HCI is the use of augmented reality (AR) in mobile apps. AR allows users to interact with digital objects in the real world, creating a seamless integration of virtual and physical reality. For example, the IKEA Place app allows users to see how furniture will look in their home before they buy it, using AR to place virtual furniture in real-world settings.

Accessibility is a crucial part of HCI, and there are many examples of interfaces designed specifically for people with

disabilities. One such example is the EyeWriter, a project that uses eye-tracking technology to allow people with paralysis to draw and write using just their eyes. This technology has opened up a whole new world of creativity and self-expression for people who were previously unable to use their hands.

Usability testing is another important part of HCI, and there are many creative ways to gather feedback from users. For example, in the video game industry, designers use telemetry data to track how players interact with the game, and use this data to make improvements. This allows designers to create games that are both fun and easy to play.

Finally, HCI has the potential to change the way we interact with machines in the future. For example, researchers are developing brain-computer interfaces that allow people to control computers using their thoughts. This technology could be used to help people with disabilities, or to create new forms of entertainment and communication.

In conclusion, Human-Computer Interaction is an exciting field that is full of creative and innovative examples of how people interact with digital devices. By designing interfaces that are easy to use, accessible, and efficient, we can make technology work for everyone, and create a better world for all.

FROM CLASSROOMS TO CORPORATE: MY INTERNSHIP EXPERIENCE - ARSHDEEP SINGH

"Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful." - Albert Schweitzer

This quote emphasizes the importance of finding joy and passion in the work one does. When we genuinely love and enjoy the tasks and challenges presented to us, we become fully engaged and committed to learning and growing.

Internships serve as transformative experience by empowering students with practical knowledge, self-discovery, and a solid foundation for future career endeavours. Through my internship at Cerence Inc., I got the opportunity to discover my passions and align my skills and interests. The pursuit of happiness and fulfilment that I got while working on my tasks became the driving force behind achieving success.

Learning Opportunities: My internship experience as a software engineer provided me with a plethora of learning opportunities that helped me develop my technical skills and knowledge in the Computer Science domain. I was able to work with experienced software developers and engineers who provided me with guidance and feedback that helped me improve my work. Through hands-on experience, I was able to apply the theoretical concepts I learned in college to real-world projects.

Collaboration & Teamwork: Working as an Intern allowed me to experience the importance of collaboration and teamwork in a professional environment. With a diverse group of individuals from different backgrounds and skill sets, I got the opportunity to learn how to communicate and collaborate effectively with my colleagues. This helped gave me a glimpse into the dynamics of working in a team-based environment.

Career Development: The world outside is vast and one needs to explore different career paths within the industry, learn about the various roles and responsibilities, and decide what career path suits them the best. I was able to gain insights into the different areas of software engineering which allowed me to identify my strengths and interests and gave me a better understanding of what I want to pursue as a career in the future.

Exposure to Industry Standards & Best Practices: During my internship, I was exposed to industry-standard tools and best practices in software engineering. I learned how to use popular software management tools, how to document your work, and follow a test-driven development. This exposure gave me a better understanding of the agile software engineering process and allowed me to develop skills that are highly valued in the industry.

Interpersonal Skills: While technical skills are important, soft skills are also essential in the workplace. One must know how to effectively communicate with colleagues, express themselves, manage their time and prioritize tasks. Additionally, socializing and participating in Corporate Events gives you a new-found confidence and has helped me become a better person.

THE IMPORTANCE OF SOFTWARE DEVELOPMENT: EMPOWERING THE DIGITAL AGE

- NIHAR PHANSALKAR

Introduction:

Software development is crucial in influencing our lives and transforming industries in today's technologically driven society. Software development has become the backbone of modern life, from mobile applications to enterprise systems. In this article, we will look at the significance of software development and how it affects numerous elements of our lives and enterprises. Whether it's increasing productivity, boosting user experiences, or driving innovation, software development enables us to fully realise the digital age's potential.

I. Enabling Efficiency and Automation

Businesses can improve efficiency and productivity by streamlining procedures and automating jobs through software development. Organisations can use specialised software solutions to automate repetitive and time-consuming tasks, eliminating human error and freeing up important resources. Software systems, from inventory management to customer

relationship management, give efficient answers to complicated challenges, allowing firms to run smoothly and successfully.

II. Enhancing User Experiences

User experience is a critical distinction for firms in today's competitive landscape. Software development allows for the construction of intuitive and user-friendly interfaces, ensuring that users and applications interact seamlessly. Software developers can create compelling experiences that respond to the specific needs and preferences of their target audience by using smart design and user research. Well-designed software, whether it's a mobile app, a website, or a desktop programme, increases user satisfaction and brand loyalty.

III. Driving Innovation and Competitive Advantage

Software development is at the cutting edge of innovation, propelling breakthroughs throughout industries. From ground-breaking technology like artificial intelligence and blockchain to game-changing business strategies, software development fosters



transformational ideas and solutions. Businesses can acquire a competitive advantage, adapt to market trends, and remain ahead of the competition by harnessing emerging technology and producing cutting-edge software. The ability to innovate through software development helps firms to disrupt existing markets, create new revenue streams, and capitalise on unexplored opportunities.

IV. Improving Decision Making with Data

Data is a vital asset in the digital age that may give critical insights for businesses. Software development is critical in data collection, analysis, and visualisation, allowing organisations to make educated decisions. Businesses may extract relevant information from massive amounts of data using data-driven software solutions, detect patterns and trends, and unearth actionable insights. Businesses can use these insights to optimise processes, find market possibilities, and make data-driven strategic decisions.

V. Enhancing Communication and Collaboration

Effective communication and teamwork are critical for every organization's success. Software development enables the creation of collaborative tools, project management systems, and communication platforms that allow team members to work together seamlessly. Software solutions, ranging from video conferencing to document sharing, help to simplify communication, bridge geographical gaps, and boost teamwork. Businesses can improve internal and external communication by employing digital solutions, resulting in increased productivity and effective project execution.

VI. Addressing Industry-Specific Challenges

Different businesses confront distinct issues that necessitate customised software solutions. Whether in healthcare, banking, logistics, or manufacturing, software development is critical to meeting industrial objectives. Custom software programmes can be used to automate difficult operations, maintain regulatory compliance, and provide industry-specific features. Businesses may overcome problems, optimise processes, and provide value to their consumers by building software that caters to unique industry requirements.

Conclusion:

Software development has become an indispensable aspect of our daily lives, revolutionizing how we work, communicate, and connect with technology. Its importance spans industries and domains, ranging from optimizing business operations to improving user experiences and spurring innovation. As technology advances, software development will remain at the forefront, enabling us to embrace new possibilities and modify our surroundings. Adopting software development as a strategic goal is critical not just for organizations to prosper in the digital age but also for individuals to remain relevant and capitalize on technology's enormous potential.

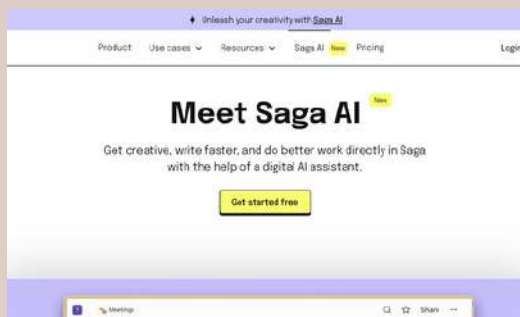
AI TOOLS: EMPOWERING INDUSTRIES AND ENHANCING PRODUCTIVITY

– ARYAN SHARMA

The rapid rise of **artificial intelligence (AI)** has led to a new era of technological advancements, revolutionizing the way we approach various fields and industries. The development of AI tools is likely to completely revamp the way things are done these days, with these tools proving to be capable of augmenting human capabilities and automating complex tasks, among many other functionalities. In this article, we will cover some of the AI tools that have been released till the month of April 2023.

Human or Not (<https://www.humanornot.ai/>)

Human or Not is an addictive AI game. In this game, we chat with a partner for two minutes and then vote if they're human or an AI bot. This game is powered by AI21labs.

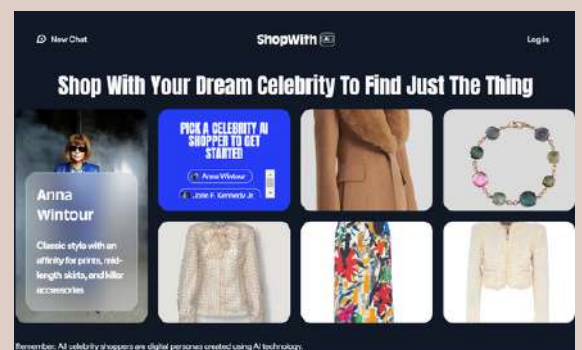


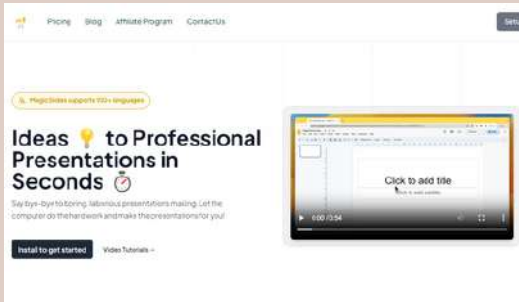
Saga AI (<https://saga.so/ai>)

Saga AI helps you draft content, brainstorm ideas, fix your grammar, translate the content into over 20 languages, rewrite the text in a required tone, and generate content in just a click. It helps you with your Code, Emails, Outlines, Blogs, Social Media, etc.

ShopWithAI (<https://goshopwith.ai/chat>)

ShopWithAI is a new personal AI stylist. It learns your specific taste and recommends clothes, furniture, etc from over a thousand brands and designers. It also allows you to choose the AI Celebrity avatar you wish to chat with.



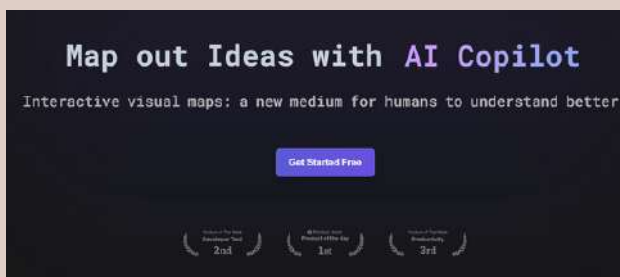
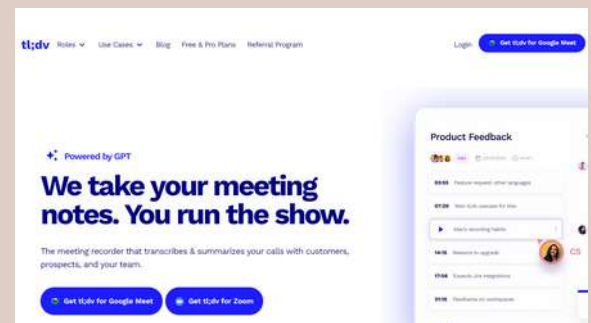


Magic Slides (<https://www.magicslides.app/>)

This tool helps you in creating professional presentations in mere seconds. You can create a presentation from just a topic or Transform text into stunning presentations.

tldv (<https://tldv.io/>)

tldv is a meeting recorder tool that transcribes and summarizes your calls with customers, prospects, or your team. This tool works with Zoom as well as Google Meet and supports more than 30 languages.

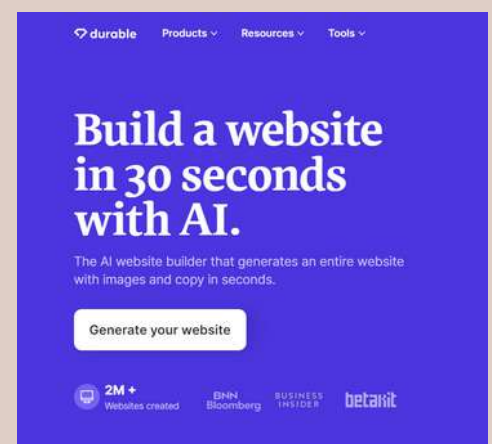


MyMap.AI (<https://www.mymap.ai/>)

You can map out your ideas easily with this AI Copilot. Superus is an AI-powered interactive visual storytelling for enhanced comprehension.

Durable (<https://durable.co/>)

Durable helps you to build a website with images for your business in 30 seconds with over 1 Million+ websites already generated.



PEACE AND PIECE

- DR PREETI MULAY

You will be surprised to know what the relationship is between these two tiny, simple English words. Even I was totally unaware but realised it recently.

The other day, as is my usual practice as a mother, I called up my beloved daughter, who was at home due to preparation leave in between final exam papers. After connecting with her immediately, I asked, "Have you collected enough pieces?" She was shocked to hear this from me. I mean to ask her, are all pieces intact to handle the upcoming peace exam (Peace is one of the subjects having final exams)? She had a blast after understanding my point of view. To appear for the peace exam, it's essential to know where all the pieces are. I mean, notes are, reading material is, question banks and case studies are, videos are, etc. Peace can be achieved only when you know where the first piece is and thereafter where the other required pieces are, and then the collection and assembly process begins thereafter to gain final peace.

In this example of an exam for my daughter, I referred to various pieces as reading materials, but in real life too, to gain peace, which everyone aspires to and expects, we need to know where that first piece is and where other pieces are spread across the mind, around, or in the world. Once you know the source to begin with, you will obtain and assemble all the pieces together to gain peace.

One of the easiest ways this new generation finds the first valuable piece is with OpenAI tools or social media platforms. To live peacefully, they hunt for pieces from non-living things. Why? You are surrounded by your own people, loved ones, friends, family, colleagues, neighbours, teachers, mentors, four-legged friends, nature, birds, trees etc to name a few then why to rely on these non-living things which are actually a brain-child of living being. Come on.

One wonderful piece of advice is that instead of merely going to ChatGPT or similar platforms, why not try GitaGPT instead? As all are aware, there are many verses in the Gita that are extremely useful for living peacefully, and it mentors everyone, as has been proven for ages. And now that the technical form of Gita, which also speaks the language of Gen Z, is available at the click of a button, why not check it out once? Of course, whether you approach friends, family, or Gita, you need to ask the apt question. "Prompt engineering" plays a vital and important role. Keywords are finally a ball game; focus on pieces like what you ask and how you ask to always gain peace.