CIE Newsletter

"Extended Reality"

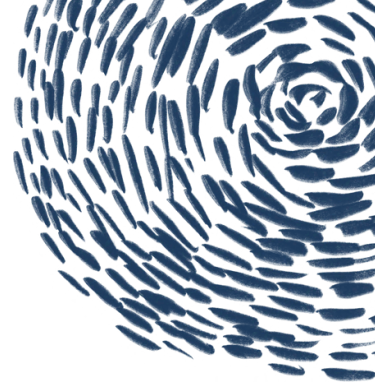Issue-9

June 2024

CENTRE FOR INNOVATION & ENTREPRENEURSHIP

PES UNIVERSITY

Extended Reality

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FOREWORD: PROF. NAGARJUNA S.
PRO-VC, PES UNIVERSITY

**Embracing Innovation and Entrepreneurship at
PES University – An Entrepreneur's Perspective**

In today's rapidly evolving world, innovation isn't just a buzzword; it's a necessity. It's the driving force behind progress, the catalyst for change, and the key to staying relevant in an increasingly competitive landscape. At PES University, we recognize the critical importance of fostering a culture of innovation and entrepreneurship, which is why initiatives like the Center for Innovation and Entrepreneurship (CIE) holds such significance.

Innovation is not confined to ground-breaking inventions or revolutionary technologies; it permeates every aspect of our lives, from the way we work to the way we communicate. It's about challenging the status quo, thinking outside the box, and daring to pursue bold ideas that have the potential to make a difference. In today's dynamic and unpredictable world, the ability to innovate is no longer a luxury; it's a prerequisite for success.

Entrepreneurship, on the other hand, provides a platform for turning innovation into action. It's about taking risks, seizing opportunities, and turning ideas into tangible outcomes. Whether it's launching a start-up, spearheading a social enterprise, or driving change within an established organization, entrepreneurship empowers individuals to harness their creativity and drive positive change in the world.

But the significance of entrepreneurship extends beyond the realm of start-ups and new ventures. In today's corporate landscape, where agility and adaptability are paramount, the concept of "intrapreneurship" is gaining traction. Many companies actively encourage their employees to think and act like entrepreneurs, empowering them to pursue new ideas, take calculated risks, and drive innovation from within.

Reflecting on my own corporate journey at Wipro, I've had the privilege of experiencing first-hand the power of intrapreneurship. From spearheading new initiatives to transforming existing processes, each opportunity has not only enriched my professional experience but also contributed to the growth and success of the organizations I've been a part of.

FOREWORD: PROF. NAGARJUNA S.
PRO-VC, PES UNIVERSITY

As we embark on this journey with CIE at PES University, I am filled with optimism and excitement for the possibilities that lie ahead. By nurturing a culture of innovation and entrepreneurship, we are not only equipping our students with the skills and mindset they need to thrive in the 21st-century economy but also laying the groundwork for meaningful impact and transformation.

By establishing CIE at both our campuses, PESU is demonstrating our vision to empowering the next generation of innovators, changemakers, and leaders. I want to express my heartfelt appreciation to the CIE leadership team and all the chairpersons for their unwavering commitment to fostering innovation and entrepreneurship.

As we move forward, let us embrace the spirit of innovation and entrepreneurship with enthusiasm and determination. Together, let us embark on this journey with optimism, resilience, and a shared sense of purpose. I have no doubt that CIE will serve as a catalyst for positive change, driving innovation, and creating opportunities for generations to come.

Here's to the success of CIE and the bright future it holds for PES University and beyond!

DIRECTOR'S DESK
PROF. SATHYA PRASAD
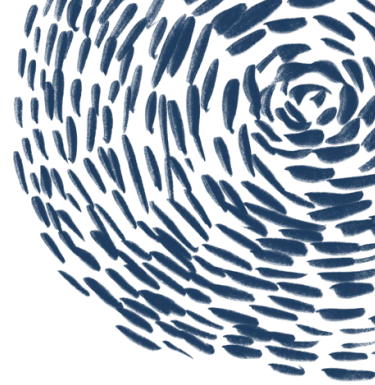
Thank you for joining us for another edition of CIE Newsletter! We are thrilled to have the Pro Vice-Chancellor, PES University, Prof. Nagarjuna Sadineni write the Foreword for this newsletter.

It's summer and it's sizzling with record temperatures and with expected rains nowhere to be seen !

Talking about seeing and vision, humans are over-reliant on vision as a sensory perception. For centuries, mankind has been curious about augmenting natural vision with artifacts like microscopes, telescopes, etc. When you combine this quest for seeing things that are outside the boundary of natural vision and computing resources, we can augment our vision and even create virtual worlds.

Welcome to the 9th issue of the CIE Newsletter where we focus on Augmented Reality (AR) and Virtual Reality (VR). AI/ML along with semiconductor chips and sensors are playing an increasingly larger role in driving AR/VR with interesting applications beyond defence: entertainment, healthcare, education and the list goes on.

It's been a particularly busy first half of the year at CIE with many exciting new initiatives coming to life. Like in a start-up, we test out many ideas and run pilots to see if there's value in us pursuing it further. In the next couple of sections, I'll outline some of the projects and what we have learned from them so far.
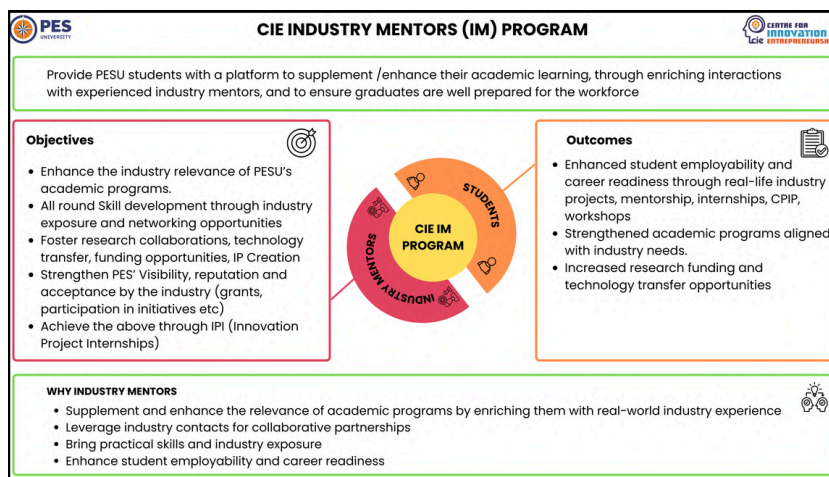
But before that, I am excited to share with you the accolades that have come the CIE @ PES University way:

- CIE was among the top 7 universities across India to be selected in the start-up incubator poster competition at the Start-up Mahakumbh in New Delhi.
- A team from CIE made it to the top 10 teams (nation wide) in the Cisco-Nasscom Foundation Thinqbator program. This start-up will receive grant and mentorship to buildout the start-up idea which originated as a CIE course project idea

CIE Industry Mentors (CIE-IM): We started with a simple idea to get industry veterans to guide students on 'innovation projects'. These types of projects carry risks, some known and many unknowns but where the reward/risk ratio is high and where the learning potential is deemed good even if the project 'fails'.

CIE INDUSTRY MENTORS (IM) PROGRAM

Provide PESU students with a platform to supplement /enhance their academic learning, through enriching interactions with experienced industry mentors, and to ensure graduates are well prepared for the workforce

Objectives
- Enhance the industry relevance of PESU's academic programs.
- All round Skill development through industry exposure and networking opportunities
- Foster research collaborations, technology transfer, funding opportunities, IP Creation
- Strengthen PES' Visibility, reputation and acceptance by the industry (grants, participation in initiatives etc)
- Achieve the above through IPI (Innovation Project Internships)

Outcomes
- Enhanced student employability and career readiness through real-life industry projects, mentorship, internships, CPIP, workshops
- Strengthened academic programs aligned with industry needs.
- Increased research funding and technology transfer opportunities

WHY INDUSTRY MENTORS
- Supplement and enhance the relevance of academic programs by enriching them with real-world industry experience
- Leverage industry contacts for collaborative partnerships
- Bring practical skills and industry exposure
- Enhance student employability and career readiness

Here's the twist – we wanted the mentors to come and spend at least one day in a week at CIE and actively guide the student innovation projects. We were pleasantly surprised when 4 industry veterans (combined experience of 120+ yrs) joined us at the beginning of the semester and helped kick off this initiative. Each of the 16 students (4 teams) chosen for the project were given a research internship on projects spread across automotive systems, Machine Learning, platform simulator and some early work on computer vision and hardware security.

CIE Startup Mindset ('CIE-L0'): Two of the most popular courses at CIE are CIE-Level 1 ('Getting Started with Entrepreneurship') and CIE-Level 2 ('Building a Lean Startup') and offered to B.Tech/B.Design students from 3rd semester and beyond as 2-credit courses. But we have a gap - CIE has no structured offering for 1st /2nd semester students or students outside of engineering. What if we could get any student at PES University started on the entrepreneurial mindset? This resulted in the curation of an activity-based 'flipped' workshop covering 10 key entrepreneurial mindset/skillsets. We are piloting this in May and will incorporate learnings to have a final version ready in time for the Aug semester.

CPIP 2024 (CAPSTONE PROJECT WITH INDUSTRY PARTNER)

Capstone Project with Industry Partner (CPIP): The 'Capstone Project with Industry Partner' (CPIP) program conducted in 2023 was very encouraging with good feedback from industry/start-up partners as well as students and faculty. This inspired us to offer it again in 2024 – we now have 5 teams working on AI/ML projects in Retail, FinTech and Healthcare with mentorship from Intel.
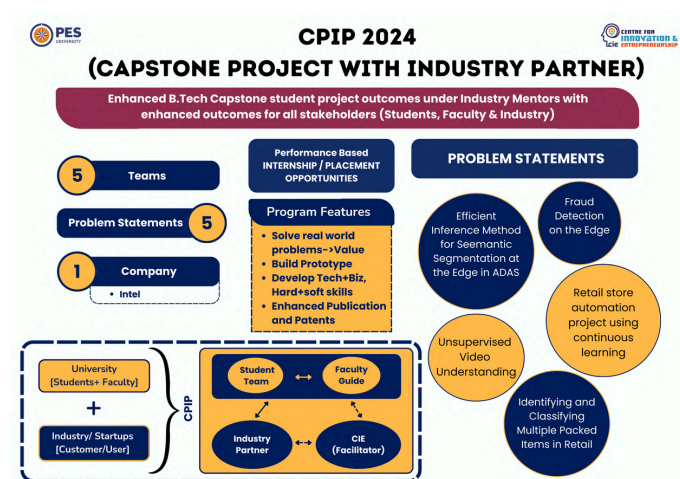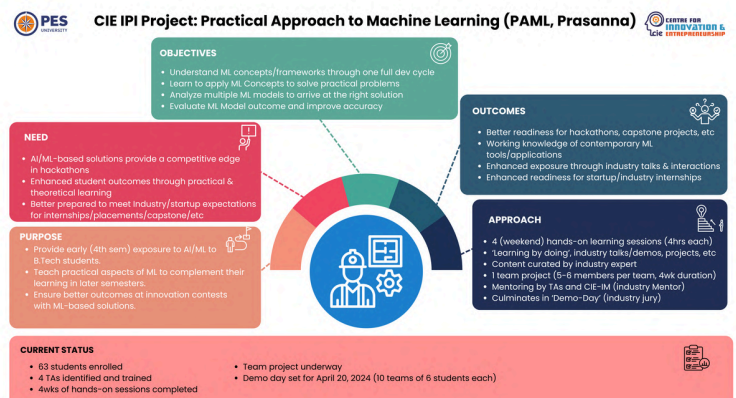
CIE Practical Approach to Machine Learning (PAML): One of the industry mentors, Prasanna Chandran and I designed the PAML workshop stretching over 4 weekend sessions, each ~4hrs long. We set out to solve the 'problem of plenty' – there is a slew of bewildering options to learn machine learning (ML) and most 1st /2nd year students find this intimidating.

CIE IPI Project: Practical Approach to Machine Learning (PAML, Prasanna)

PAML was conceived as a 'kinder/gentler' introduction to ML comprising of solving real-life problems with assistance from senior students under the leadership of the industry mentor. Strong student feedback led to the workshop being extended to cover a term project and demo-day with awards given for top 3 best projects.

CIE Aarambh (Harvard Manage Mentor): The 2nd batch of mostly final-year students completed the Harvard Manage Mentor program focused on helping acquire skillset that help them in the transition from university to workplace. The total number of students who have completed this certified program is 58.

I welcome you to enjoy the rest of the newsletter.

CIE-PAML WORKSHOP

CIE organized a transformative workshop titled *PAML - A Practical Approach to Machine Learning.* The primary objective of the workshop was to immerse students in the realm of AI and ML, arming them with the knowledge and skills necessary to navigate this dynamic domain. With hackathons and real-world problem statements increasingly asking participants to incorporate AI and ML components in their project, proficiency in these areas has become indispensable for students aspiring to excel in technology-driven fields. This workshop was led by four dedicated CIE interns, Aditya Sharma, Sanraj Lachhiramka, Vanshika Jadhav, Shereen Anand and a seasoned Industry Mentor, Mr. Prasanna S Chandran, whose several years of experience brought a lot of experience to the table.

Spanning over four weekends, the workshop was fast-paced, designed to provide hands-on coding exercises and interactive sessions. Students were taught to acquire datasets, fine-tune models and present their findings effectively. The samosa breaks served as an opportunity for students to network, allowing students to connect with their peers, exchange ideas, and gain insights into each other's projects and aspirations.

"Getting a bunch of like-minded people together to learn ML makes it an easier task, rather than trying to learn by yourself. I tried it both ways, and the workshop makes it so much easier to understand something code-heavy." - said Kunjal, a participant.

Towards the end of the workshop, participants had to come up with a working ML model, which was constantly guided and mentored by the interns and Prasanna Sir

In conclusion, the PAML workshop served as a pivotal stepping stone for students entering these fields. Through hands-on learning, mentorship, and collaboration, participants emerged equipped to tackle real-world challenges and excel in the dynamic landscape of technology.

Capstone Projects: Bridging the Gap with Industry

Q: A bunch of us freshmen constantly hear about the Capstone project, but can't really tell what it really is. Could you clarify what it's about and put it into perspective?
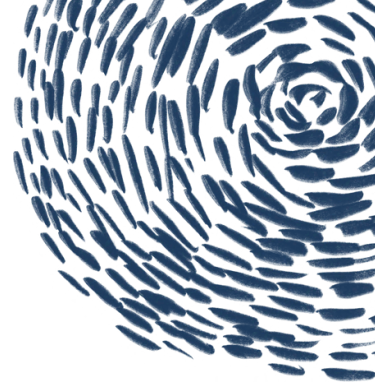
A: "In the initial years of the engineering degree program, we focus on imparting core knowledge and subsequently delve into specialized areas based on students' interests. While we incorporate experiential learning through projects such as mini projects in the early stages, we recognize the importance of comprehensive, end-to-end enterprise project development for practical understanding and pragmatic learning. However, such endeavours require a nuanced approach; thus, while undertaking substantial projects, one must consider diverse aspects ranging from managing personnel to selecting appropriate technologies. A successful project transcends single-subject knowledge and necessitates a broad understanding across various domains. This holistic perspective is particularly emphasized in capstone projects, which are characterized by their larger scale and interdisciplinary nature. Capstone projects tackle challenges of societal, environmental, or technological significance, requiring students to integrate knowledge from multiple domains to devise effective solutions."

Q: Reflecting on Intel's introduction of three problem statements to PES in 2018, there are two remarkable aspects to consider. Firstly, could you provide insights into how Intel came to collaborate with PES? Secondly, what factors enabled our students to achieve in just six weeks what typically required months for Intel developers to accomplish?"

A: "Our strong relationship with Intel is primarily fostered by CIE and its Director, Prof. Sathya Prasad, who brings valuable experience from Intel, facilitating smooth communication and collaboration. Additionally, we maintain close contact with Prof. Ankur, currently at Intel Bangalore, further enhancing our partnership. Together, we identified a mutually intriguing challenge and decided to involve our students. Leveraging our existing Game Development Club, hosted by the CS department, equipped students with essential skills in Unity, Blender, and related tools. This familiarity enabled our students to swiftly grasp the problems posed by Intel. Furthermore, prior experience in developing a game account equipped them with insights into designing components within gaming environments. Handpicked from the Game Development Club, these students were well-aligned with the project's objectives, allowing them to effectively address real-time challenges within a concise six-week timeframe."

Q: "Could you discuss the significance of industry problems for students? Can you provide an example? Additionally, what challenges do students encounter when dealing with industrial problems, and how does tackling these challenges contribute to their development?"

A: "These are genuine challenges, exemplified by issues such as Alzheimer's Disease prediction and early autism detection. However, acquiring datasets for medical concerns like autism detection poses significant challenges, requiring methods such as brain CT scans or continuous child monitoring. The creation of such datasets presents a critical hurdle. Simply applying pre-existing models to datasets can lead to mechanical and monotonous execution. Identifying genuine problems is itself complex; for instance, determining if face recognition performs well under diverse conditions necessitates extensive field experience. Academic settings may lack this insight, highlighting the value of industry input, driven by practical business needs.

When tackling a business problem, students confront real-world challenges that stimulate their understanding, creativity, and overall development. Unlike readily available solutions where creativity is limited, industry problems demand innovative thinking and application of learned knowledge. They necessitate the development of problem-solving recipes, combining various approaches to address unique challenges. This expansion of horizons fosters valuable skills and prepares students for the complexities of real-world problem-solving."
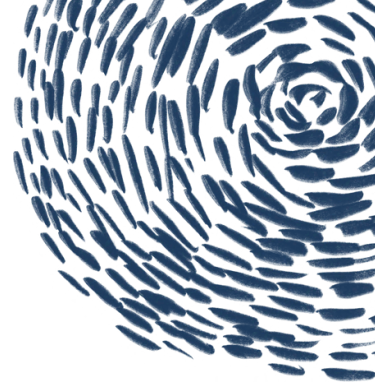
Q: What in your opinion should capstone projects be considered to be more likely to be successful and relevant to the current market?

A: " It depends on the objective. See there are research guided projects. There can be delta improvement in the architectures that we may use in developing a new model and in the research angle there may be a change.

But there are certain projects which are business driven, which are patentable for example. That may be an objective. So, if you measure the success of a capstone project in terms of a paper publication resulting out of it or a patent resulting out of it or just a doable piece or it is going as a product to some other bigger project. So, if you can meet one of these criteria then I would say it is a successful project."

Q: Could you also mention any standout projects from the past? perhaps ones that you found particularly noteworthy? What are your insights on how these projects benefit student development?

A: "Two years ago, some of my students embarked on a pioneering venture called Gen-AI, well before it became a buzzword. One notable project involved text-to-image generation for forensic applications, enabling the creation of facial composites from textual descriptions of suspects. Another recent standout project involved developing a sales co-pilot system translating text inputs into SQL queries, a complex challenge in bridging language understanding. We've also delved into cutting-edge areas like adversarial perturbations, safeguarding images from manipulation at the input level. These projects exemplify our commitment to innovative AI applications, nurturing student skills and foresight in emerging technologies."

Q: The current market for CS engineers is saturated. Regardless of qualifications, many engineers struggle to find placement. Will the Capstone project differentiate engineers in job placement or provide a fresh perspective on problem-solving approaches?

A: " The capstone project holds significance due to its scale and complexity, presenting a unique learning opportunity. In today's dynamic landscape, continuous learning is paramount. Personally, my journey from electrical engineering to computer science underscores this need for ongoing education. Unlike deterministic coursework, projects are stochastic, demanding adaptability and problem-solving agility. They foster not only technical skills but also group dynamics and infrastructure management. Through capstone projects, one learns to operate at scale and adapt to evolving technologies swiftly. These invaluable lessons prepare engineers to navigate diverse challenges in their careers effectively."

Q: What has been your favourite part about assisting and mentoring capstone projects?

A: "My favourite part about assisting and mentoring capstone projects is the initial phase where students seek problem statements. Witnessing their excitement as they deliberate which problem to tackle is truly invigorating.
Moreover, as students delve deeper into their chosen problem statements, they inevitably encounter existing solutions and research in the global landscape. Their exploration and analysis not only contribute to their own understanding but also enriches my knowledge in the field. I believe in the mutual exchange of knowledge between students and mentors, which fosters growth for both parties.
Overall, I find the intellectual discussions and knowledge-sharing moments to be the most enriching aspects of capstone projects."

SIT-DOWN WITH DR. SHIVAKUMAR SASTRY

The Future of Extended Reality

In a captivating conversation, Dr. Shivakumar Sastry, a seasoned expert in the field of XR (Extended Reality) systems , shared invaluable insights on the current state and future trajectory of this transformative technology. As a former professor at the University of Akron and a veteran of leading technology companies like Rockwell Automation and Xerox, Dr. Sastry offers a unique blend of academic rigor and industry experience.

Central to the discussion was the need to move beyond the "flashy" aspects of XR devices and focus on critical elements such as workflow integration and user-centric design. Dr. Sastry emphasized, *"Technology is almost always less than five to ten percent of what it takes to make adoption happen. Most of the effort has to do with workflow integration."* This perspective is rooted in his extensive experience, including developing an augmented reality system for the NASA SUITS. His team initially used game engines but quickly realized this approach was neither scalable nor sustainable.
They opted to decouple the content from the game engine framework, storing it in a relational database, allowing for better integration and scalability.

This emphasis on workflow integration is particularly crucial in the Indian context, where Dr. Sastry sees immense potential for XR technologies to address pressing challenges. He highlighted the education sector as a prime example, noting that the affordability of XR devices is a significant barrier to widespread adoption. *"Even if the devices that come are available for 300-400 dollars, it's only rich universities that can afford it. How do you get the government colleges to say I will be able to buy 10 devices or 50 devices?"* This underscores the need for XR solutions that are not only technologically advanced but also accessible and scalable to democratize the technology truly.

Dr. Sastry also emphasized the importance of modular and extensible system design. *"The more systems grow over time, functionality gets added, functionality will have to be changed because of technological evolution—all kinds of things will happen. You cannot throw away the core of your system before you can cope with these changes. So you have to have a framework; a design framework that allows you to extend and*
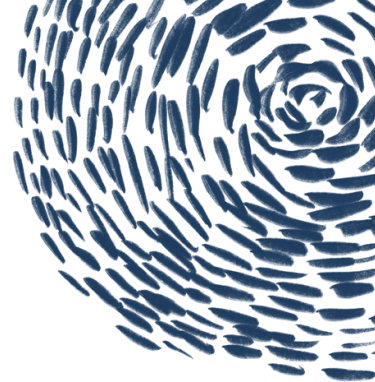
grow your system as your demands change. That calls for very serious design tools." This approach ensures that XR systems can adapt to evolving user needs and integrate emerging technologies effectively.

He further stressed the necessity of interdisciplinary collaboration in XR system design. *"You cannot make human factors and integrate them in your system design without disciplinary input from different domains,"* he stated, highlighting the value of diverse perspectives, including those from psychology, design, and architecture. Dr. Sastry's own experience working with a team that included individuals from various backgrounds underscores the importance of this collaborative approach.

Looking to the future, Dr. Sastry shared his vision for the direction of XR technology, cautioning against the hype and buzzwords that often accompany emerging technologies. He expressed skepticism about the immediate potential of the metaverse and social media-driven XR applications, stating, *"All that's going to be fun. As long as you know, people's data can be harvested to sell them some advertisements, it will work. But I don't see that as a serious revenue-generating option for driving industry home."* Instead, he highlighted opportunities in areas such as engineering processes, medical practices, tourism, and education, where XR can enhance productivity, safety, and user experience.

To empower the next generation of XR innovators, Dr. Sastry offered valuable advice. He emphasized the importance of developing design skills, system thinking, and performance analysis capabilities, rather than solely focusing on mastering specific technologies. *"Design skills, design processes. How do you go about taking a system from conception to reality? Not the implementation, but the design process. That, I think, is lacking,"* he stated, underscoring the need for a more holistic approach to problem-solving.

Throughout the conversation, Dr. Sastry's deep understanding of the XR landscape and his unwavering commitment to driving meaningful change shone through. His insights serve as a valuable roadmap for the future of this transformative technology, guiding us toward a future where XR solutions are not merely flashy gimmicks, but powerful tools that can truly improve the lives of people and communities. As he concluded, *"You have to move the tech forward, but more importantly you have to understand the context in which you do so."*

SIT-DOWN WITH DR. ANBUMANI SUBRAMANIAN

The Intersection of XR and AI

Dr. Anbumani Subramanian is an AI researcher and engineer who has worked on AR applications of AI for industry-leading tech companies. With a career spanning over 28 years, Dr. Anbumani worked on the very first open driving dataset for India, which focuses on the unstructured driving patterns that are prevalent in India. He is currently working on building autonomous driving technology in collaboration with IIIT Hyderabad through image recognition and AI processing.

It is safe to say that he knows what he's talking about in the realm of XR, and we are thrilled to bring you this article, which is based on the 1-hour interaction that the team was lucky enough to have with him.

Q: The potential applications of XR are very exciting. What excites you the most about XR, and what do you think is the most viable application of this technology?
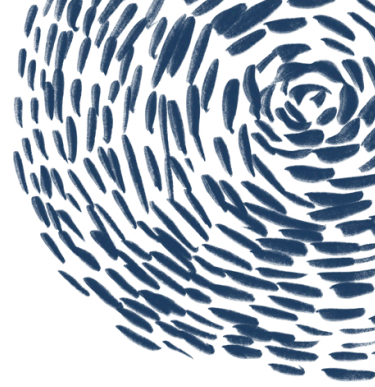
A: Dr. Anbumani believes that XR has tremendous applications in online conferencing. The development of most of the popular consumer-focused tech products has been through social effects. He believes that XR is going to be no different: *"VR, movies, and video games will exist in a market of their own, but the most viable application—or the application that excites me the most—would be conferencing."*

Q: When will XR technology become affordable enough for widespread adoption, and when do you think developing countries like India can benefit from this?

A: He chose not to give out a specific number for when XR tech would see widespread adoption, but Dr. Anbumani believes that XR adoption will be more like a community that buys gaming laptops or a community that buys iPhones, where the adoption isn't at the scale of the smartphone revolution in India, but more of a scenario where people in a certain niche fully adopt the technology. Right now, we are seeing massive developments in the consumer XR market with the push Meta and Apple are giving this technology, but XR doesn't seem to be developing at the same pace when we look at enterprise solutions. The only company that directs a significant amount of its workforce to enterprise solutions that is making large contributions to the XR market, is Microsoft, with their HoloLens, which is targeted towards healthcare professionals, engineers, operators of industrial machinery, soldiers, and law enforcement.

SIT-DOWN WITH DR. ANBUMANI SUBRAMANIAN

Q: Is XR equipment the future of personal computing, or is XR equipment a peripheral that'll aid personal computing?

A: *"Probably the latter."* Dr. Anbumani believes that the tech industry tends to promise a certain future, and invest lots of money in the development of the technology that will help them reach that future. But, more often than not, the future that they anticipated is not something the consumers want. A good example of this would be network computing, where industry leaders claimed that your personal computer would be a dumb device with no compute power and all the compute would take place on a powerful server. This prediction obviously did not come true; we still perform most day-to-day operations locally on our computers. But in the process of making network computing a reality, we invented cloud storage services and developed cloud computing to a point where we can now render and play video games over the cloud in real time. Similarly, the future that Meta or Apple promises will probably not come true, but in the process of reaching that future, tech companies will develop the technology enough for it to truly serve what the consumer wants.
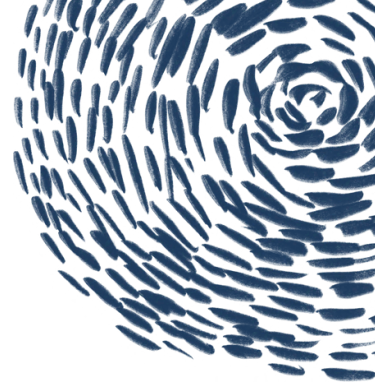
What does the consumer want? We'll find out only when the technology is developed and affordable enough to reach the general public.

Q: If a student in any branch of PES wanted to enter the XR industry, how would they be able to contribute to it? [BTech, B Des, BCom, BBA, Psychology, BCA]

A: *"The BBA and BCom students will contribute the same way they do in every other sector: they market the products, build business plans for the company, and keep account of the company's finances."* The business and accounting majors will help the industry flourish by ensuring steady business and marketing the products to the right audience, but the real burden of developing the technology is on engineers, designers, artists, and psychologists.

The burden on a psychologist in the XR space would be to figure out ways through which we make the XR experience seem less like extended reality and trick the brain into thinking that it's just normal reality. The burden on the designer would be to create interfaces that would create more immersive and smoother interactions with the computer and the artist would need to ensure that the visuals in the 3D space are attractive and do not slip into the uncanny valley. The burden on the engineer would be to develop technology that can keep up with the designer's interfaces and the psychologist's optimizations. Better refresh rates and better batteries are both advancements in technology that XR could benefit from.

SIT-DOWN WITH DR. ANBUMANI SUBRAMANIAN

The engineers also need to *"step down from their pedestal"* as technologists, whose objective is to build the most advanced technology and try to understand what the consumer needs; work with the psychologist and designer to work towards a future in which using an XR peripheral is as easy as using your phone.

Q: What should an engineering or design student learn if they want to work in XR?

A: Long story short: The engineer needs to understand human interactions better, and the designer needs to understand technology better. Get yourself familiar with the SDKs put out by Apple and Meta; take courses on human-computer interactions; and understand how multi-modal interactions benefit XR.

Q: How do you envision XR and AI working together in the future?

A: *"AI is here, whether you accept it or not, but XR is still out there. Where do they meet? It's hard to predict that right now. AI and XR will continue to be the buzzwords for the next few years. But I don't see the money yet in XR."* Since the AI industry is much more advanced than the XR industry, it's hard to predict how AI will influence the latter. But once XR picks up pace; we are looking at a world where products like Apple Vision Pro and Meta Quest could be powered by AI. This opens limitless consumer applications, but it all depends on the mainstream adoption of the technology. If this happens, companies will have continued incentive and newfound confidence—incentive to further develop the tech because they have noticed consumers appreciating the product, and confidence to integrate these two exciting technologies because they aren't worried about shipping a buggy mess of a product into the market.

IINDUSTRY CONNECT: MR. RAGHAVENDRA BHAT

In a recent conversation, we had the pleasure of speaking with Mr. Raghavendra Bhat, Senior Principal Engineer at Intel, who has been with the company for nearly 18 years. Mr. Bhat's experience spans various technologies and industry segments, including automotive, healthcare, and retail. He emphasizes a holistic system view, integrating multiple technologies to address specific industry needs.

When asked about the current state of XR, he said, *"We are at the cusp of a new era where the digital and physical worlds are blending more seamlessly than ever before. Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) are no longer confined to science fiction; they are becoming integral to various industries."*

Mr. Bhat pointed out that one of the most significant advancements in XR is its application in healthcare. *"Imagine a world where surgeons can practice complex procedures in a virtual environment before operating on a real patient. This not only reduces the risk but also enhances the precision and confidence of medical professionals,"* he explained. The use of XR in medical training and simulations is revolutionizing the way healthcare is delivered.
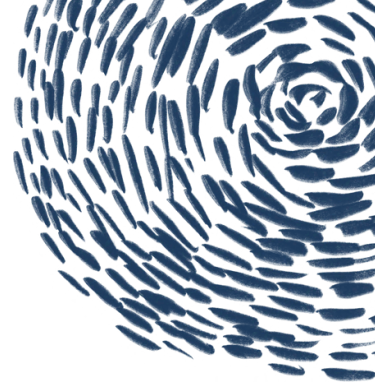
Education is another sector poised to benefit immensely from XR. *"Traditional teaching methods are being augmented with immersive experiences that make learning more engaging and effective,"* he noted. He also shared examples of virtual field trips and interactive simulations that bring abstract concepts to life, making them more comprehensible and memorable for students.

In the realm of entertainment, XR is already making waves. *"The gaming industry has been a pioneer in adopting VR and AR, providing users with unparalleled immersive experiences,"*. He highlighted how XR is transforming storytelling, allowing audiences to be part of the narrative rather than passive observers. This shift is creating new opportunities for content creators and pushing the boundaries of creativity.

However, Mr.Bhat acknowledged that the widespread adoption of XR comes with its set of challenges. *"One of the biggest hurdles is the high cost of XR hardware and the need for significant computational power,"* he admitted.

While prices are gradually decreasing, making XR more accessible, there is still a long way to go before it becomes a mainstream technology.

Privacy and security concerns are also paramount. *"As we collect more data through XR devices, ensuring that this information is protected becomes crucial,"* he emphasized. He called for stringent regulations and robust security measures to prevent data breaches and misuse.

Another challenge is the potential for physical and psychological effects on users. *"Extended use of VR can lead to issues like motion sickness, eye strain, and even dissociation from the real world,"* Mr. Bhat cautioned. Researchers are actively studying these effects to develop guidelines and best practices for safe XR usage.

Despite these challenges, he is optimistic about the future of XR. *"The potential applications of XR are vast and varied, from remote work and virtual meetings to immersive shopping experiences and advanced training programs,"* he said. The COVID-19 pandemic has accelerated the adoption of XR technologies, highlighting their importance in maintaining connectivity and continuity in various aspects of life.

Looking ahead, he envisions a world where XR is seamlessly integrated into our daily routines. *"Imagine waking up and putting on a pair of AR glasses that provide you with real-time information about your schedule, the weather, and your health metrics,"* he suggested. This level of integration could enhance productivity and improve the quality of life.

Mr. Bhat also highlighted the role of XR in fostering social connections. *"In a world where physical distances are becoming less relevant, XR can help bridge the gap and create a sense of presence and intimacy,"* he said. Virtual gatherings, social VR platforms, and collaborative workspaces are just a few examples of how XR can bring people together.

We also were keen on learning how we as students can opt for industry challenges, Mr. Bhat emphasized the importance of a multidisciplinary approach. *"Future engineers need to be equipped with not only technical skills but also a deep understanding of ethics, communication, and teamwork,"* he said. He stressed the value of project-based learning and industry collaborations in providing real-world experience.

In conclusion, Mr. Raghavendra Bhat's insights paint a promising picture of the future of Extended Reality. As he aptly put it, *"We are just scratching the surface of what XR can achieve. With continued innovation and thoughtful implementation, XR has the power to transform our world in ways we are only beginning to imagine."* His optimism and vision serve as a beacon for researchers, developers, and enthusiasts in the XR field.

CIE JOURNEY 2018-2023

INSPIRE **IDEATE** **INNOVATE**

2018

- **CIE Basecamp:** 700+ students, 9 weeks
- **CIE Bootcamp:** 30 students, residential 1-week program
- **1st Course:** CIE-Level 1 "Getting to know Entrepreneurship"
- **Industry Contest:** Intel India Student Contest for Game Dev; Rs 1 Lac prize money
- **International Conference:** CIE perspective presented at UC Berkeley GVL 2018.
- **Microsoft CodeFunDo++ :** 200+ Students participate

2019

- **New Course:** CIE-Level 2 "Building A Lean Startup"
- **Intel Student AI/ML Contest:** 207 students, Rs.2.25 Lac in prize money
- **GDC-IIT Madras I-NCUBATE program:** 5 PES teams selected
- **Microsoft WISE** (Women in SW Engg) selects PES for inaugural Bangalore program
- **10th Effectuation Conference, Berlin:** CIE presentation
- **Hult Prize Challenge:** 1st time at PES

2020

- **Intel student AI/ML Contest:** 319 students, 20 Faculty, Rs 1.25 Lac awards
- **BV Jagadeesh (Silicon Valley VC):** 5-day Startup workshop
- **New Course:** Practical Approach to Deep Learning (with Intel AI Academy)
- **UC Berkeley "Semester Abroad" program**

38 Cohorts Graduated

1989 Students Graduated

46 Industry/Startup Internships

CIE JOURNEY

2021

- **Cisco/NASSCOM Foundation ThingQbator Program:** FOUR PES teams in top 10, Rs 5 lacks seed funding per team
- **LnF (Learn n Fun):** Gamified AI/ML Learning Platform (prototype), students from 3 depts
- IEEE EDUCON (Vienna) conference publication, co-authored with Intel India

1400+
Students Participating in **9** Industry Programs

6 Mil
Industry Grants/Awards

6
New Courses at CIE

2022

- **Cisco/NASSCOM Foundation ThingQbator Program :** FIVE PES teams in top 10, Rs 5 lacks seed funding per team
- CIE hosts Mr. Rostow Ravanan, Chairman, Nasscom Foundation
- AMA Talk series 'Startup Symphonies' with Startup Founders
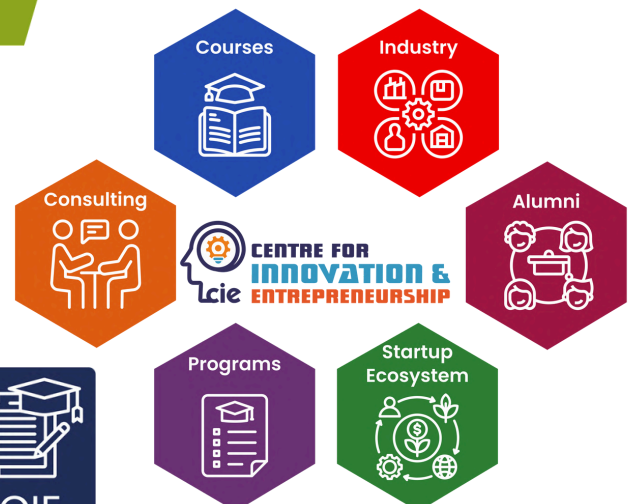- ICL2022 Vienna conference publication (LnF - gamified learning platform)

2023

- **CIE Aarambh program:** with Harvard Manage Mentor
- CPIP (Capstone Project with Industry Partners) kicked off with 3 companies
- **New Course:** with Intel on Firmware/ System Architecture
- AMA Talks series continues
- Invited to the IIT Bombay SemiX Advisory Board
- **CIE Summer Workshop (SWS) 2023:** a 7-week workshops
- PESU Entrepreneurship Cell from both RR and EC campuses co-host E-Summit
- **BV Jagadeesh (Silicon Valley VC):** 4-day Startup Masterclass
- CIE generates 46 external internships

Courses

Industry

Consulting

CENTRE FOR
INNOVATION &
ENTREPRENEURSHIP
cie

Alumni

Programs

Startup Ecosystem

INSIDE CAVE LABS:
DR. ADITHYA BALASUBRAMANYAM
(HEAD OF CAVE LABS, PES UNIVERSITY)

In talks with CAVE Labs

CAVE Labs is the Extended Reality Research Division of PES University, led by Dr. Adithya Balasubramanyam since its inception back in November 2022. The lab has been focusing on developing impactful AR and VR applications over the last 18 months. The applications built by the lab have attracted commercial interest, leading to CAVE Labs collaborating with start-ups and companies in various domains to assist them in refining their products.

Some noteworthy projects of the lab include:
- A virtual twin of a drone in VR for drone pilot training.
- A VR driving simulator being built in collaboration with Infinity Engineering.
- Collaboration with Fabrik, a Bangalore-based VR company, to develop their web-based VR platform.
- Applications designed to aid nursing education. The software is currently being used at the PESU EC campus to teach nursing students about human anatomy.
- A virtual recreation of the BE Block in PES University.

An interview with lab director Adithya Balasubramanyam was conducted after learning about the fascinating projects that CAVE Labs has undertaken.
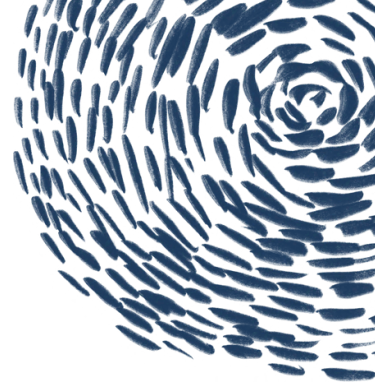
Q: In today's world, the cost of a VR headset isn't that different from the cost of a smartphone. Why do you think people are reluctant to buy it?

A: "While the hardware itself is becoming cheaper, the software hasn't caught up yet, which gives the general public very little incentive to buy the hardware. We can solve this problem by utilizing the hardware and building high utility applications on it. Software in general has smaller life cycles and IT software development will be triggered only when the hardware is good and has a large market reach. The cost of the hardware is going down and consumer adoption will pick up pace."

Future Of Medical Learning in AR/VR

INSIDE CAVE LABS:
DR. ADITHYA BALASUBRAMANYAM
(HEAD OF CAVE LABS, PES UNIVERSITY)

Q:Which sectors in entertainment do you think could benefit from VR?

A:"Video games are obviously leveraging VR very well to build immersive experiences— which is where the bulk of the application of VR in entertainment probably lies. But that's not to say that other sectors in entertainment won't benefit from VR.

The event planning industry could set up booths in their events that could be used to interact with celebrities and things like that, but I don't know how much of a USP this could be for them since the costs of these devices are still pretty high, so you can't buy enough of them to give all the attendees a smooth experience. Also, we've been seeing things like '4D' and '7D' movies for a while now, which are just multimodal stimuli added on to the core story. Maybe we could see more of that with VR and—who knows, maybe we could even see interactive movies where everyone in the theatre has a different experience."

Q: Why would people want to virtually enter college?

A: "In the post-COVID world, people are meeting people online all the time. Meeting online is much quicker than meeting in person and with schedules getting busier by the day, online meets are only going to increase. But, in optimizing for time efficiency, we are losing out on the social experience of meeting people in person." CAVE Labs envisions a future where students can get the feeling of studying together in the college library, while in the comfort of their homes or clubs meeting in the college basement through the power of VR instead of the status quo where students get on a Zoom call and figure out how to get everyone to turn on their videos.

PESU Metaversity-
Digital Twin Of PES University

Q: How long before a common person can rationalize the purchase decision of a VR headset?

A: "Considering how VR headsets are getting more affordable by the day and taking into account the amount of money being invested in VR software startups, I don't think it'll be long before the average person will go out and start buying VR headsets. Six to seven years maybe. It depends on the schemes and tax benefits that the government introduces, but considering how the government has set aside funds specifically for XR development, it does seem like the Indian government is taking XR seriously."

SIT-DOWN WITH DR. ADITHYA BALASUBRAMANYAM
(HEAD OF CAVE LABS, PES UNIVERSITY)

Q: Could you list some popular software being used in XR development right now?

A: "We use Unity 3D, Blender, OpenGL, and WebGL at CAVE Labs, but a popular substitute for Unity is Unreal Engine. We, along with most XR development labs and studios, prefer Unity3D because it has a better community and is easier to learn. Additionally, we have started integrating tools like Fabrik Space, utilizing Three.js and React Three Fiber, which allow for the creation of sophisticated 3D and VR applications entirely on the web."

Researchers at the lab developed a wearable sensor system for tracking the orientation of bone joint segments. This system can recreate body movements within 1.5 degrees of accuracy. This technology has exciting applications in physiotherapy, where therapists can monitor patients' movements with high precision, allowing for more targeted interventions and improved treatment outcomes. Furthermore, the system has the potential to be used in sports training, potentially benefiting teams like the Royal Challengers Bangalore (RCB) by providing detailed data on player movement.
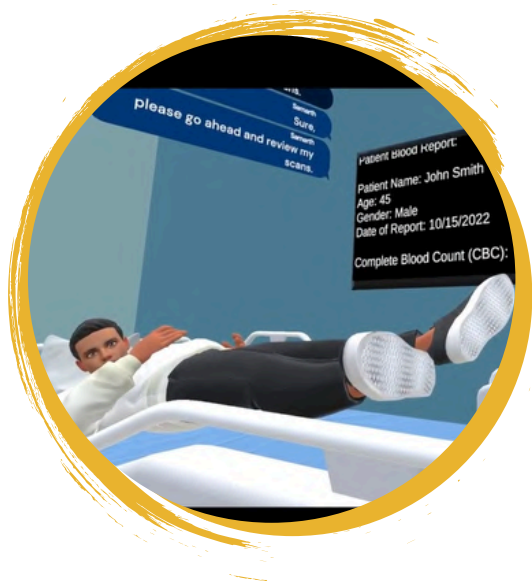
Q: The wearable sensor system sounds very useful, but how exactly does it relate to extended reality?

A: "XR is not just creating interfaces that'll take us to a different world, it is also the act of enhancing experiences by influencing real-world scenarios. Motion tracking is an underlying technology that allows the development of AR/VR applications and experiences."

By incorporating cutting-edge tools and technologies, CAVE Labs is pushing the boundaries of what is possible in the field of extended reality, paving the way for innovative solutions and applications in various domains.
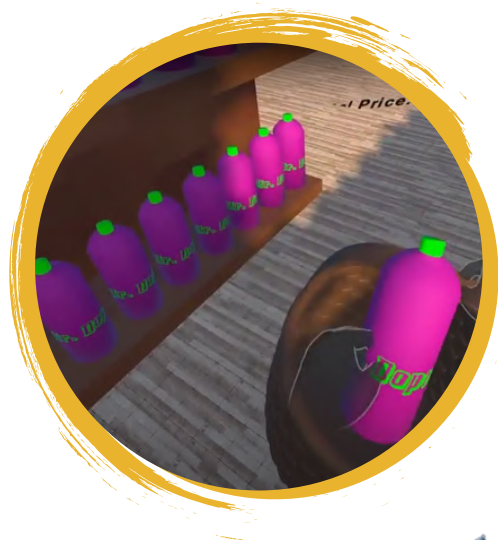
THE SANGAM NETWORKING EVENT: DIGITAL TWIN SOLUTIONS

We had the privilege of observing the recent Sangam Networking Event in Bengaluru, and it was an eye-opening experience. Held at PES University on July 3rd-4th, 2024, the event unveiled comprehensive blueprints for Digital Twin-enabled solutions. These plans aim to guide the design and architecture of innovative solutions, define stakeholder roles, identify potential customers, outline funding structures, establish governance mechanisms, and create implementation roadmaps.

The Third Networking Event of the Department of Telecommunications (DoT)'s Sangam - Digital Twin initiative brought together over 100 participants, including representatives from leading companies. The atmosphere was one of collaboration.

Discussions took place on several key verticals:

- **Multimodal Transport Planning**
- **Enhancing Healthcare Access and Services**
- **Assessment of Environmental Quality**
- **Disaster Response System Management**

Critical horizontal topics included:

- **Privacy Enhancing Technologies (PETs)**
- **Virtual World Creation**

The event aimed to foster collaboration, sparking new projects, ideas, and capabilities. Emphasis was placed on cross-sectoral, data-driven infrastructure and ensuring privacy through advanced technologies. The importance of AI-driven insights and collaborative environments was a recurring theme.

The DoT expressed gratitude to all participants for their active engagement, highlighting the collective effort required for sustainable and efficient infrastructure solutions.

Since its unveiling, the Sangam initiative has garnered significant attention for its revolutionary approach to infrastructure planning and design. By utilizing cutting-edge technologies and fostering collective intelligence, Sangam aims to create sustainable and efficient infrastructure solutions.

The success of this event reflects the growing momentum and enthusiasm for Digital Twin solutions, promising a future where integrated, intelligent systems drive economic, social, and environmental progress.

CISCO THINGQBATOR: COHORT 6

Cisco ThingQbator is a CSR initiative of Cisco in partnership with NASSCOM Foundation with the primary goal to foster innovation, create a platform for learning, developing digital skills, and mentoring; thereby empowering students to craft solutions addressing pressing social challenges and turn their ideas into holistic solutions for our greatest problems. In a fierce competition featuring an overwhelming 1050 student applications from across India, PES University stood out owing to the emphasis laid on fostering creativity and an entrepreneurial spirit. Eight out of the top twenty teams were from PES University with **NeuRoar** landing a spot in the top 10 and securing further incubation support of 5 Lakh Rupees!

Eight out of the Top Twenty: A Remarkable Feat

NueRoar

NeuRoar is all about harnessing the power of assistive technology tools for neurodivergent individuals, who often struggle with forming positive habits and feeling included in mainstream society due to a lack of awareness. The app focuses on three key elements: habit building, community support, and emotional regulation, which are common pain points for neurodivergent individuals like those with ADHD and autism. The habit-building section includes an AI-powered tool with visual cues and a habit tracker. The emotional regulation features include a "slimming centre" for energy-channelling exercises, an AI chatbot, and a mood tracker, providing a comprehensive solution. NeuRoar fosters community building through expert-authored articles in a blog section and interactive community sessions for all users.

GrowPal

GrowPal set out to overcome a lack of organisation and marketing for small home-run businesses. Providing a platform to showcase jewellery, clothing and household goods to create a centralised ecosystem in a super disjointed space, GrowPal is going strong in its venture to help small businesses flourish. Despite facing legal troubles, GrowPal continues to grow with great enthusiasm which has been something of a staple for the company since its inception.
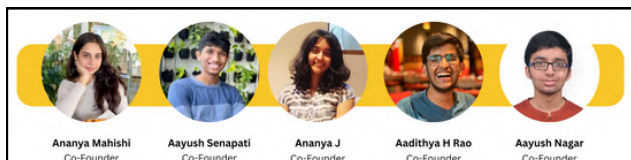
Xperios - Turning your vision boards into reality

Xperios - derived from 'Experiences' is an app designed for young adults to explore new hobbies, experiences, travel opportunities etc within their city. The app tailors suggestions based on user preferences, offering a blend of activities within and entirely out of the user's comfort zone. Xperios incentivises participation in new activities through a reward points system that focuses on three metrics- creativity, fitness, and social interaction. By reducing the effort involved in finding new activities, Xperios aims to revive young adults' enthusiasm for pursuing their hobbies during leisure instead of spending time on screens.
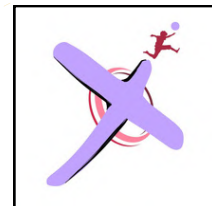
QuickPick

QuickPick addresses overcrowding during breaks in institutions with large populations. It offers a meal ordering and reordering solution aimed at streamlining the process and alleviating the requirement of long queues. QuickPick's comprehensive solution includes an app and chatbot that enables users to place and collect food orders when ready and a web based vendor interface for them to manage their orders. With interfaces for both vendors and users, QuickPick ensures a seamless experience for all parties involved.

Ananya Mahishi — Co-Founder
Aayush Senapati — Co-Founder
Ananya J — Co-Founder
Aadithya H Rao — Co-Founder
Aayush Nagar — Co-Founder

Finn

"If science students knew how to do their taxes they'd be too powerful"; everyone has heard this but this is what Finn strived to accomplish — spreading financial literacy among students and young earners to make well-informed decisions about their future and investments by offering hands-on learning experiences, certified courses, and a gamified approach to empower individuals with practical financial skills, thereby fostering economic empowerment and equality. Finn's biggest advantage is their extremely engaging way of conveying their lessons, a perfectly balanced fun way of learning finally up on display.

CISCO THINGQBATOR: COHORT 6

Voyage - Your Guardian on the Go

'Voyage' is a safety app primarily designed to ensure the safety of women while travelling. The app collects crime data from diverse areas and employs machine learning to categorise locations into red, orange, or green zones, helping users plan their safety. The app also features an SOS button that sends the user's location to three chosen contacts as well as directly to police stations and hospitals in the vicinity in case of dire situations. Additionally, the app includes an interesting ride-sharing feature with other verified users on the app. 'Voyage's' main focus is to build a community of verified and credible users to promote collective safety during travel.

Robin Internships

"I want an internship but I'm not technically sound", a common problem faced by every engineering student was also something the co-founders of Robin Internships faced. Robin internships became a centre for students with almost no experience to get into a workforce and get a feel of things for themselves and make a little extra pocket money. Starting off as a basic interface for CIE to a full fledged website used during Aatmatrisha's volunteer domain selection, Robin internships has real life application and solves issues for college students and management. A community with over five hundred active users and growing, Robin internships continues to help students land their first real life work experience.
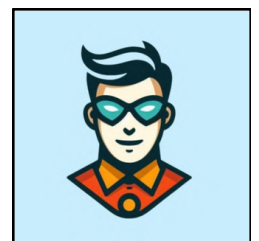
THE ENTREPRENEURSHIP CELL (E-CELL)

The Entrepreneurship Cell (E-Cell) at PES University, under the guidance of the Center for Innovation and Entrepreneurship (CIE), stands as a platform for promoting entrepreneurial spirit in young minds. Led by the dynamic duo, Samarth S Rao and Shrishti A, the E-Cell strives to surpass mere ideas into actionable ventures.

E-Cell's flagship event, the E-Summit, held on the 4th and 5th of November 2023, served as an association for students, professionals, and budding entrepreneurs alike. E-Summit hosts a once-in-a-lifetime experience, offering interactive group competitions and enriching solo activities. Participants explored the complications in entrepreneurship, handling crisis scenarios, and brainstorming innovative solutions to modern challenges.

E-Summit featured engaging competitions and activities, including Founder Fusion, where teams navigated product development and crisis management. Startup Valley challenged participants to build innovative startups through five rounds, culminating in final pitch simulations. Elevate or Eliminate provided a thrilling challenge, testing entrepreneurial insights through escalating trials, from business quizzes to an air crash scenario.

El Camino introduced an auction-style competition where teams strategically acquired Breaking Bad characters to devise innovative solutions.

Best Regional Manager challenged participants with case studies, budget management, and stressful interviews, evaluating their managerial skills and resilience. A panel discussion explored the opportunities and challenges for graduating students in corporate and startup sectors, offering valuable insights

A keynote session by Rohit Agarwala highlighted the importance of social media as a distribution channel, emphasizing content creation's role in modern marketing.

E-Summit 2023 was indeed an enriching experience, offering a platform for learning, innovation, and networking in the realm of entrepreneurship.

DIPLOMAT WARS 4.0

PES Model United Nations (MUN) society brings together students interested in participating in various MUN conferences held across the country. It has the reputation of being the most prestigious MUN Society in the southern circuit and possesses an incredible record in the conferences attended. The concept of Model United Nations aims to help young delegates across various educational spectra develop their logic and analytical skills by simulating a variety of situations and allowing them to debate issues of international importance.

PES Model United Nations (MUN) society, hosted Diplomat Wars 4.0, a dynamic event spanning two days on the 3rd and 4th of February 2024. The event aimed to cultivate diplomatic skills among students through five challenging rounds: quiz, debate, problem-solving, crisis simulation, and consequential simulations.

Mr. Thierry Berthelot, Consulate General of France in Bangalore, graced the occasion as the chief guest, enlightened participants on diplomacy's significance, and shared insights on French foreign affairs and Franco-Indian relations.

The initial round focused on current affairs, blending logical reasoning, history, and geopolitics, while Round 2 sharpened negotiation skills through debating diverse problem statements. Out of 50 teams, the top 25 advanced to the next round.

Catch 22, the third round, tested problem-solving abilities under pressure, narrowing down the field to 21 teams. In the fourth round, participants tackled a global crisis, demonstrating their adeptness in debate and diplomacy. Only the top 5 teams proceeded.

The finale, staged by Stuti Pathak, President of the PES MUN Society, featured an air crash competition where teams presented their country's suitability to join the ASEAN alliance without compromising foreign policies. Three teams clinched honors and cash prizes, culminating in a successful and enriching Diplomat Wars 4.0.

STUDENTS IN FOCUS

Akhil Siddharth

Akhil, a distinguished alumnus of PES university, graduated in 2020 with a degree in Electronics and Communication engineering, specializing in VLSI. Post graduation, he worked at Walmart Labs as a full stack developer in supply chain technology. With a deep-seated interest in the convergence of technology and policy, Akhil transitioned to a role at the International Innovation Corps, a fellowship program under the University of Chicago Trust in India. Currently he serves as a Product Manager at the National Health Authority, a body affiliated with the Ministry of Health and Family Welfare. Akhil is currently working on the Unified Health Interface as part of a project called the Ayushman Bharat Digital Health Mission, aimed at digitizing health records and establishing longitudinal health history in India. Beyond his professional pursuits, Akhil is a dedicated social investor, driven by the belief in empowering individuals to achieve self-sufficiency. While at PES, Akhil actively participated in QQC - Quotient Quiz Club and excelled in numerous events. He advises students to embrace failure as a learning opportunity, seize every opportunity that they come across and push themselves to be the very best they can be.

Aditya Mehta

Aditya, a proud alumnus of PES University, graduated in 2023 with a degree in Mechanical Engineering. He co-founded Epicure Robotics, focusing on developing automated robotic kitchens and fresh smoothie vending machines. Transitioning from industrial automation at Systemantics, Aditya aimed to explore consumer robotics. His entrepreneurial journey began when he met his co-founder at IEEE RAS. Together, they established the Rero lab, India's first virtual robotics lab initiated by an educational institution. Aditya's leadership extended to his role as the chairperson of IEEE RAS, where he gained diverse experience in operations, event management, and project mentoring. This role significantly contributed to shaping his character and encouraging him to be multifaceted. Aditya emphasizes the importance of never being hesitant in seeking guidance and learning from one's circle because at the end of the day, that will transport you to where you really want to be.

STUDENTS IN FOCUS

Anirudh Rowjee

Anirudh, an 8th-semester CSE student, harbours a passion for distributed systems and databases, alongside a deep love for music and reading. He is currently interning at Couchbase, a distributed database company that innovates to deliver high-performance data platforms, suited for transactional, analytics, and Gen-AI workloads. As someone who's interested in large-scale distributed data systems, he loves being at Couchbase because he gets to see live systems that are handling petabytes of data a day.

His collegiate journey is marked by active involvement in various clubs. As the co-founder of EC Campus Hackerspace, former chairperson of MUNSOC, former head of PES Innovation Lab, and former vice-chairperson of ACM, Anirudh honed invaluable leadership skills. From mediating conflicts to actively sustaining culture and the spirit of community to safeguard it from fading away, his involvement in student clubs played a pivotal role in shaping his character. An advocate for open source collaboration, Anirudh's journey began with the PES open-source community. He firmly believes in the power of collaborative efforts to drive positive change. Post-graduation, Anirudh aims to gain practical experience, recognizing the invaluable insights obtained from observing concepts manifest in real-world scenarios. His advice to fellow students is to learn by building and to master fundamental concepts to reap long term dividends for their careers.

Sarthak R. Bharadwaj

Sarthak, a first year BBA student has been creating music for 4 years. With a musical background spanning thirteen years, his genres of focus include dark R&B, chill trap and psychedelic rock. Sarthak is a billboard certified producer, with his work charting on Apple Music and accumulating over 10 million streams across all platforms. He has collaborated with multiple world renowned artists including Future, Meek Mill, BIA, Designer, Stunna 4 Vegas and Lil Tecca. Beyond his musical achievements, Sarthak is deeply committed to community service, often leveraging his music to raise funds for charitable causes. From making beats as a hobby to becoming a billboard producer, Sarthaks story exemplifies the lengths to which dedication and self-belief can take you.

STUDENTS IN FOCUS

Rahul Jaikrishna

Rahul Jaikrishna, a second semester CSE student and avid Machine Learning enthusiast is passionate about using Computer Science to bring a positive impact in this world. He has collaborated with Intel on numerous projects, one of which is 'Cyber Detective,' focused on combating cyberbullying online. Representing India at the AI Global Impact Festival, Rahul showcased his project 'WhaleScout,' aimed at saving whales from extinction and addressing climate change. Rahul is also actively involved in community initiatives, and co-hosted India's first Economics hackathon, sponsored by notable companies like Tezos and JetBrains. He earned a full scholarship for a Quantum Computing course offered by IBM and Google Quantum AI. During his six-week internship at Upkey, Rahul delivered a compelling pitch to investors, securing second place amongst 2000 participants and led the Cumulus Cosmos team project, leveraging AI for the early detection of malaria. Furthermore, Rahul's technical prowess shone through as his team secured second place at both 'Terrathon' and 'Develop for Her'. Rahul's journey exemplifies strong leadership skills and a commitment to addressing global health challenges.

Varun Mudaliar

Varun Mudaliar, a second-semester CSE student, is a force to be reckoned with on the cricket field. Currently serving as a batting all-rounder for Saudi Arabia's men's cricket team, Varun's journey to success began during his tenure with the under 19 men's cricket team. Representing the nation at prestigious events such as the Asia Cup Qualifiers and ICC Cricket World Cup Qualifiers, he showcased his talent and dedication. Despite the demands of his academics, Varun remains committed to his cricketing career, striking a fine balance between them both. He diligently follows the schedule provided by his team management and ensures regular practice sessions to hone his skills. Varun focuses on self-belief and perseverance and firmly believes that unwavering faith in oneself and dedicated effort are the keys to achieving one's greatest aspirations.

STUDENTS IN FOCUS

Adithya Sridhar

Adithya, a first-year design student, discovered his passion for Blender and began honing his skills during the onset of the COVID pandemic, when remote work opportunities surged. Transitioning from experimentation to professional work, he collaborated with studios involved in creating 3D assets for video games, partnering with prominent publishers. Starting on an open VFX forum, Adithya initially worked with individual artists and indie developers, gradually progressing to larger projects for established studios and contributing to game development and open-source software plugins. Presently, Adithya along with three of his friends are ambitiously developing their own game with a small indie studio, undertaking the challenging task of coding both the game engine and render engine from scratch. Adithya looks forward to one day seeing his game fully developed and his journey highlights the importance of persisting through difficulties until tangible results are achieved.

Rohith Suju

Rohith Suju, a 2nd semester ECE student is passionate about all things tech, particularly in the realm of electronics and thrives on tackling real-world challenges. He recently got into the Honeywell Leadership Challenge Academy (HLCA) and attended a week-long STEM boot camp at USSRC Space Camp Alabama. He was one among 236 other students from around the world, 26 being from India. Rohith collaborated with peers from across the globe, engaging in activities ranging from building rockets and heat shields to crafting spacecraft components. This immersive experience not only enriched his technical skills but also refined his leadership abilities. With aspirations in embedded development, Rohith is eager to immerse himself in low-level projects and believes that doing what you love is the secret to perpetual enthusiasm.

STARTUP SPOTLIGHT: GREENIFLY

Q: Can you provide an overview of your start-up and the problem you are aiming to solve?

A: "We are an agritech drone start-up. We have multispectral drones which will fly over an area of land while conducting the entire NPK content analysis. We are making use of these multispectral cameras and our EIML models which give you the nitrogen, phosphorus and potassium content. We have used this to provide information on yield percentages as well. We provide the Agri-inputs required and inculcate processes which will lead to the desired quality of yield. We also have a spray drone which will do the required actions, like Agri-input, fertilizing, spraying chemicals, etc. And the spray will only be done in the specified area of land."

Q: How important do you think it is to find these niches in your problems and your solutions to break into the market? And could you just give us a roadmap of how you think you did it?

A: "There are two things, one, let's say you don't have a very, unique product. Probably there is someone else doing it, you've done only a couple of changes and then you have, you're like into the market. It depends if the market is very big, it can entertain any kind of people and thousands of people come in as well. Two, let's say the market is very established and then you need to have something which is going to be different from everybody else. So you need to have your mode. Also when you are looking in from an investing point of view, let's say your product is basic, but you have a very good market share. Well, investors are going to be looking at what you can pay out of it."

Q: You told us about how you took this as your capstone problem statement and then you took it forward. Can you tell us how that worked in conjunction with you taking it up as a startup as well? Your capstone and your startup, how did they help each other work?

STARTUP SPOTLIGHT: GREENIFLY

A: "Initially, I was really new to this entire start-up environment. It was a capstone agenda initially since we didn't know what we were supposed to do. We just knew that we needed to detect diseases and prevent them. And our ideas were completely different. We wanted to do something for the blind, as I mentioned previously, but after reading one article from MIT we realized, there is some scope in agriculture.

Then later, in the first phase of capstone we had to plan out everything, that basically helped us lay out all these foundations. At that point of time we pitched to PESU Venture Labs (PVL). That is when we got our funding, which helped us understand that this is possible even practically. That is when we had our MVP, where we had a prototype being made and then from there on we scaled up."

Q: Could you elaborate on the roadmap of scaling this across the country or maybe even more? Also what do you think a startup should be and have to compete with big players in the market as you scale it bigger?

A: "Right now, we are looking at coffee and tea, which is going to open up a global market for us. Initially, the southern part of our country because we are very comfortable here and the connections that we have helps us get in here. Further down the line, we want to go into the north because that is where the majority of the rice market is and then the northeast as well. That is where you are going to get the majority of the tea and coffee estates as well. Once you are able to unlock this, and if our model is able to achieve an accuracy of 98 percent, 99 percent, it is going to be a very easy entrance for us into the global market. That is a kind of development. Yes,

of course, in the funding, right now, we are looking, we are raising pre-seed. And then we plan on going up. Speaking of the market, it's important that your start-up is tech strong and there is a uniqueness involved in it. It also comes down to how the market is, how the market is going to handle it."

CIE INTERNS

SIMICS INTERNS

Q: How would you define Simics? And what are some of its identified applications?
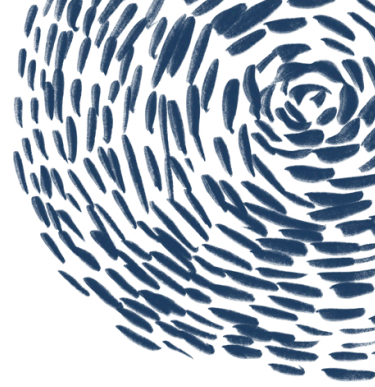
A: Simics is a software that creates a virtual version of complex hardware, allowing developers to test and debug software without needing the real equipment. It is also used in cross-functional teams to test the software's compatibility with the hardware before the hardware is even put to production. This capability makes Simics a valuable asset in the engineering field.

Q: What did the interns do over the course of the internship?

A: The objective of the internships was for the interns to understand how Simics works and figure out applications for the software. One area of exploration was engineering education. While researching, experimenting with the program's capabilities, and consulting with engineers from Intel and faculty from the university, the interns discovered various applications of Simics beyond the initial focus on education.

Even though the interns are currently (as of April 2024) developing a workshop about Simics for the students of the university, it's important to acknowledge Simics' significant contributions to hardware testing and development.

Akshat VA

Kunal Kishore

Sharanya Shetty

Shreevathsa GP

Sanraj Lachhiramka

Tejas Karanji

B M Madhumitha

Adarsh Hegde

Vanshika Jadhav

Herman Singh Umrao

Shereen Anand

Anna Singh

CIE INTERNS

IVI INTERNS

Q: "How would you explain IVI to someone new to this concept? And what is your internship about?"

A: "IVI stands for In-vehicle infotainment
It's like a system that you find in modern cars which have maps and all such stuff integrated into the car and a bunch of information about the car which is displayed on one single screen. What we are trying to do, is, we are trying to build auto motor android hardware, for example, Raspberry Pi build-up for an IVI system, which we can further extend with various modules and stuff deployment of an IVI system requires complex embedded words that the company uses here at CIE. What we are trying to do is dump it down, and make automobile work for Raspberry Pi, the one we are
using is a proof of concept for a further heavy workload of what the system
can render, we might have to scale up in the future"

Q: "How did you and your team gain such extensive knowledge, not covered in your college curriculum?"

A: "Our college curriculum doesn't cover what we're doing with projects. We're self-taught, learning as we go. Our main resources are from the open-source Android platform. The open-source community around Android is vast and active. Learners can engage with this community to seek help, share knowledge, and collaborate on projects related to IVI development. They've been invaluable in troubleshooting problems and finding solutions"

Q: So what drove you to pursue an internship in the IVI domain?

A: "The drive to pursue an internship in the IVI domain stems from a collective passion for the work.", said Akshat.
"Despite encountering failures, our commitment propels us to finish what we started. For us, dedication to our tasks is key.", Tejas added.
"We believe in embracing every challenge as an opportunity for growth and improvement.", Kunal said.
"Keeping our ultimate goal in mind amidst challenges is crucial. So, despite setbacks, our passion, commitment, and focus on continuous improvement keep us moving forward in the IVI domain.", expressed Shreevathsa G P.
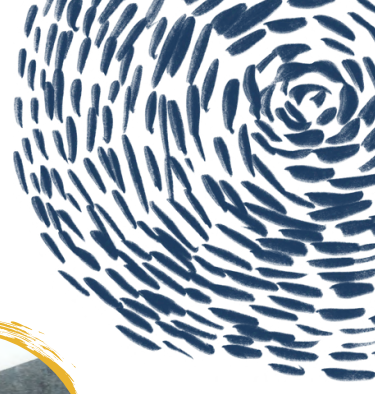
Aditya Sharma

Makarand Gokhale

Prathyush Kamti

Krishna K R

MEET THE NEWSLETTER TEAM

Natasha Dias
Chasing dreams, catching smiles and crafting my story, one adventure at a time.

Lohith Anand
Take the leap of faith.

Shrishti
Long story short, I survived

Archit
I totally submitted all my work right on time!!!

Sneha Verma
A canvas of curiosity, painting my aura with the vibrant strokes of imagination.

Adithya Rohit
English or Spanish?

Srijita Das
Coffee, Critique, Conquer, Repeat

Manjari Kulkarni
If being amazing was a crime, I'd be serving a life sentence.

Dhruv Tandon
""You miss 100% of the shots you don't take-Wayne Gretzky" - Michael Scott"-Dhruv Tandon

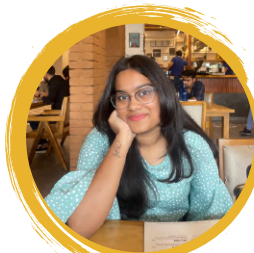**Srilakshmi**
Tried to be the next Rory Gilmore, turns out I'm more Lorelai - all coffee, deadlines, and living life on my own terms (IYKYK)

Aniurudh
How can you tell that someone's a liar? I mean, assuming that their pants aren't on fire.

Aditya Chaitanya
If I had a nickel for every time I said "But when you think about it, what really is xyz?", I'd have a lot of nickels.

Contact US

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