We believe in peace and peaceful development, not only for ourselves but for people all over the world.

-Lal Bahadur Shastri
IIT Delhi Abu Dhabi admission for India students likely through JEE: Director


IIT Delhi Abu Dhabi campus is set to open in 2024. In an interview, director Rangan Banerjee said the JEE Board is yet to approve the proposal.

Candidates can get access to all the details about JEE Advanced including eligibility, syllabus, exam pattern, sample papers, cutoff, counselling, seat allotment etc.

Both new campuses of Indian Institute of Technology (IIT) Delhi, Abu Dhabi and Jhajjar, Haryana, are set to open in 2024. Director Rangan Banerjee spoke to Careers360 about admissions; how each IIT Delhi department has been tasked with making its curriculum more flexible; its mentorship programme to help students handle stress; the focus on cancer and sports technology at the Jhajjar campus; new hostel; funding and more. Edited excerpts below.
Q. How is IIT Delhi’s branch at Abu Dhabi panning out?

A. We are quite excited about it. It’s our first venture outside the country. The IIT Delhi Abu Dhabi campus is scheduled to start in the 2024 academic cycle. The United Arab Emirates (UAE) government has identified a temporary campus in Zayed University, a public university in Dubai. For the first two to three years, the institute will function from the university retrofitted for us. Meanwhile, we will identify a new campus of our own. We will be offering undergraduate and master’s programmes. While things are still at the planning stage, we have been doing extensive outreach in the UAE. We have had a large number of events for school children. We have had a School Immersion Programme in Mathematics where a group of students came to IIT Delhi. We also had a 10-day bootcamp for them. We also participated in the International Oil and Gas Exhibition at UAE because we will be offering a programme on energy.

We are trying to ensure the ecosystem knows about us and accordingly, students can make an informed decision to join the IIT Delhi Abu Dhabi campus.

Q. Why was Abu Dhabi chosen? How will this collaboration work in terms of admissions, courses and placements?

A. The UAE government and India signed a memorandum of understanding (MoU) and one of the areas of collaboration was the setting up of an IIT. Because of this, it was a strategic decision. Further, we were asked by the ministry to set-up a campus in the UAE and later, we then narrowed down to Abu Dhabi.

On the admission front, we are not in a position to give you a correct answer because we have not finalised these things. However, it is very clear that there will be two separate channels: one channel for Indian students and other channel for non-Indian students. For Indian students, it is likely that there will be something related to the Joint Entrance Examination (JEE). We have to receive approval from the JEE Board before we confirm.

Q. When will Jhajjar campus be inaugurated? What will make the new campus different from the existing one?

A. IIT Delhi Jhajjar is planned as a healthcare hub. Today, in our institute, out of 600 faculty, around 100 are working on various aspects of healthcare. So, we decided that let’s make the Jhajjar campus, whose land was given by the Haryana government, dedicated to healthcare. We are doing this in collaboration with All India Institute of Medical Sciences (AIIMS) Jhajjar, which also has the National Cancer Institute.
Cancer will be one of the focus areas. However, we are also looking at personalised medicine and digital healthcare. Additionally, we are also looking at sports technology and performance enhancement and injury prevention to provide an extra edge to our sportsmen and women. The Jhajjar campus is a greenfield project for us and looking at investments. Haryana government, the alumni and industry will chip-in with the funds and resources required. But we believe that healthcare is a domain where engineering, science and medicine can get together, and we are sure that we can make some significant breakthroughs at an affordable price.

Q. In the light of recent incidents during the IIT Delhi fest, how are you ensuring security?

A. We are reviewing the entire protocols at IIT Delhi. Further, we have created a committee with student members and women faculty and staff. We are looking at all washrooms and other facilities. We are trying to think through what other measures we should take to ensure safety and security.

We have taken stock of the incident and we will take stock of future festivals and see that all the protocols are implemented. We do have women security guards and webcams, but there is more we can do to stop such shameful incidents happening on our campus.

Q. What new subjects and courses are being added? What is changing in the curriculum?

A. A committee with many professors chaired by Professor Atul Narang of the chemical engineering department did an overall review and gave insights. The committee has given its report. Further, we have given guidelines to each department and academic entity. Each academic entity should look at its curriculum in bringing more flexibility, more learning-by-doing, and sustainability. These were also the few recommendations by the committee. We foresee implementing the new curriculum by June 2024.

The new curriculum will also look at how to change the pedagogy and make courses more interesting. However, the onus is on departments to come-up with curriculum. We have also asked departments to seek feedback from industry and alumni before we launch the curriculum. We are seeing how to include artificial intelligence and machine learning that can be integrated in every course curriculum.

Q. What new initiatives is IIT Delhi taking to generate funds? Are you able to repay the Higher Education Finance Agency (HEFA) loan amounts?

A. We have been able to repay some of the HEFA loan amount through our corpus and internal resources. We took a Rs 645 crore loan and we are able to pay that. But the issue is not the repayment of the HEFA loan. The institute needs significant resources for its growth. We are over 60 years old. Most of our hostels need
to be demolished and rebuilt. This needs a significant corpus. Further, we have taken additional land in RK Puram, Delhi and want to create an international students’ and visitors’ hostel. It's 0.75 acres on which we plan to make a multi-storey hostel.

We have the ability to pay HEFA right now but we do not have the ability to take additional loans for the amount required for our aspirations. That's a challenge. We are reaching out to alumni, government and other areas. Also, if people and government in Delhi-NCR region have an intent to support IIT Delhi, we shall be happy to discuss.

**Q. What initiatives are being taken to ensure students from all backgrounds are treated equally?**

**A.** For us, all students are absolutely equal. All our systems and facilities are intended in a way where we do not acknowledge or recognise what is a student’s background. We are in the business of education and we are trying to give the best education to students and what they deserve. We have now created mechanisms including ST/SC cell and an office for diversity and inclusion. We have an initiative on caste equality. We are taking every complaint seriously.

Further, we would like to support all our students and we understand that different students have different abilities, irrespective of caste. Essentially, some people may have trouble with academics. On this front, we are trying to find more ways in which we can support students. For us, caste, gender, orientation, none of these matter. Our focus is on faculty, students, research and education. Unfortunately, whenever something happens, the whole ecosystem gets disrupted. We want to have an inclusive ecosystem and we are committed towards it.

**Q. What efforts are being made to reduce stress on students?**

**A.** Similar to IIT Bombay, we are planning to make some changes in the undergraduate curriculum. We are trying to have dialogues with students. We have also created an Academic Progress Group. We are also planning to help students with backlogs through multiple-exits of different types. We are trying to do something for the first year, which is usually a problematic year for students. We have discussed this with all the heads of departments. Further, we want departments to reach out to students and ensure students can come and talk to faculty. We also plan to slow-pace certain programmes. For instance, we are trying to remove the compulsion of finishing the course in four years. While currently we don't have concrete solutions, we have the right intent.
Q. With rise in student suicides in Kota, how do you look at the rising competition?

A. We have to focus on cooperation instead of competition. Getting into IITs is not the only goal in life. There are so many good students but we don't have enough seats in IITs to accommodate every student. I don't know the solution but clearly, this is a problem we need to address. We need to provide confidence in every individual and student so that his or her inner capabilities can come through.

To cope with this, we are planning for a mentorship programme where faculty and student mentors support a small number of students, to ensure a connection and that we can understand students individually. We believe that each of our students has very good capabilities. Some may clear some courses quickly, some are better in some other things. It is a societal problem and we need to find a solution.

Q. What are the focus areas of IIT Delhi’s research and innovation park?

A. The research and innovation park will focus on healthcare, artificial intelligence, smart manufacturing, defence, technology, sustainability, energy and climate. This is done through IIT Delhi’s Foundation for Innovation and Technology Transfer (FIIT). In the research park, we have a combination of start-ups and incubation systems and established companies. Tata Consultancy Services (TCS) is one of our anchor partners. We are planning to get onboard some larger companies and start-ups. The idea is that companies from different industries co-locate with us.

For both start-ups and companies, we have a high and low engagement model based on the kind of engagement these organisations have with our ecosystem. Further, organisations have to pay an amount of the cost involved.

Q. What new courses and departments have been introduced or are in the pipeline?

A. In the 2023-24 academic year, we started MTech in robotics. Before this, we started MTech in cybersecurity and bachelor of design in last academic year. However, we are planning to combine new programmes from different departments.

Q. What is in the IIT 2047 vision document? IIT Delhi is leading that effort.

A. We haven’t moved on that. IITs were set-up by the Sarkar Committee headed by Nalini Sarkar way back in 1950s. We proposed that it would be worthwhile for IITs to re-look at the vision and how we can provide the
leadership and thought required by the institutes. In intent, it was agreed by the council. However, we have yet to see what can be done on this.

Q. With this year’s placements around the corner and companies still struggling, how do you foresee the placements for this year?

A. I hope they will be good. IITs have been sheltered from the rest of the system in terms of placements. Although, we had good placements last year. We are still gearing up for placements this year.

On high packages, we have a problem with these numbers and hype that is created. Because reasonable technical jobs are considered to be sub-par. Further, reporting of media on a few packages creates an imbalance. We need to have a balance.

**Union Minister Dr Jitendra Singh says Technocrats can add value to Civil Services delivery**


Educational background of Engineers and their expertise will help accomplish the Flagship Programmes of the Government, particularly those that are technology driven: Dr Jitendra Singh

“Under the leadership of PM Modi, India is now steering the world in innovative technologies”: Dr Jitendra Singh

Dr Jitendra Singh addresses the IIT Delhi Alumni Public Service Day function

Union Minister Dr Jitendra Singh today said, Technocrats can add value to Civil Services delivery.

Educational background of technocrats and their expertise can help optimally accomplish many a Flagship Programmes initiated by the Government headed by Prime Minister Shri Narendra Modi, particularly because most of these are technology driven like SVAMITVA, Gati Shakti, DBT, Face Recognition Technology for DLC etc, he said.
The Union Minister of State (Independent Charge) Science & Technology, MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space, was addressing the IIT Delhi Alumni Public Service Day function.

Dr Jitendra Singh said, under the leadership of Prime Minister Shri Narendra Modi, India is now steering the world in innovative technologies. We are on course to our target of reducing Greenhouse gases emission, and achieve Net Zero by 2070.

India is today one of the leading users of non-conventional energy including electric automobiles, wind & solar energy and the world's first Hydrogen powered bus has been made in India, said the Minister. “The world is looking up to us for leads,” he said.

Dr Jitendra Singh said, we are today among the world's top five economies and India has jumped from 81st to 40th rank in the Global Innovation Index, 2022. During the Covid pandemic, India not only saved its own population but also helped the world by providing vaccines and we also delivered the world's first DNA vaccine.

Dr Jitendra Singh said, our Chandrayaan Mission was the first to discover evidence of water on the Moon and the Aditya-L1 solar mission is led by a woman Director. PM Modi has provided an enabling milieu to India's endeavours in Space research, and S&T. PM Modi has emerged the tallest leader in the world after the G20 Summit.
"Today the world is ready to be led by India. The declaration of International Yoga Day and International Year of Millets by the UN is proof of our rising stature. Now is the time for all of us Indians to rise to the occasion and seize the opportunity," he said.

Dr Jitendra Singh said, the role of IIT Engineers is both ‘active’ and ‘passive’ in today’s times, - ‘active’, as they are looked up by the society as highly qualified, expert brains and tech savvy whereas the IITians, also being members of the same society, they have a responsibility to motivate the society they live in and are a part of, without intimidation. The youth today are not only seeking jobs but acting as job providers by turning entrepreneurs with their own Startups.

“Today there are over 3,000 Agritech Startups and are very successful in areas like Aroma Mission and Lavender cultivation, quite a few of them do not have high qualifications, but are very innovative,” he said.

The National Education Policy, NEP-2020 addresses such issues and has liberated the students from being “prisoners of their aspirations”, he said, adding that the age of working in silos is over.

Dr Jitendra Singh called for wider synergy among all streams of professions for achieving the "Amrit Kaal" goals over the next 25 years. He said the dictum is: “The whole of Science, plus the whole of Government, plus the whole of the Nation.”
Focus on cutting-edge tech, Dhankhar tells IIT-Delhi students

October 26, 2023 https://indianexpress.com/article/cities/delhi/focus-on-cutting-edge-tech-dhankhar-tells-iit-delhi-students-8999754/

IIT-Delhi Director Prof Rangan Banerjee, Deputy Director (operations) Prof TR Sreekrishnan, Deputy Director (strategy & planning) Prof Ambuj Sagar and Professor Narayanan D Kurur also attended the event.

Addressing students of IIT-Delhi Wednesday, Vice-President Jagdeep Dhankhar said IITs have long been the crucible in which the minds that have transformed India and the world were forged.

Dhankhar asked students to focus their efforts on cutting-edge tech such as Artificial Intelligence, Quantum Computing, and Green Energy as they strive towards realising “Bharat 2047”, while lauding them for harnessing “emerging technologies to create cutting-edge products that are changing the way we live, work and relate to each other”.

The Vice-President also reflected on the image that IIT holds across the world and said many world leaders have stated their interest in having an IIT campus in their country.

IIT is all set to open in Zanzibar, Tanzania, with a batch of 50 undergraduate students and 20 Master’s students. It will also be the first to be led by a woman director.
During the hour-long session, he also interacted with students and faculty. He called upon the youth to “decimate and neutralise the false narrative being peddled by certain forces to taint and tarnish the image of Bharat and its institutions”.

“IITs, I know for sure, people from the village come, people from humble backgrounds come, people who have made it with great difficulty, but a different impression is sold to the outside world,” Dhankhar said.

“From revolutionising the agricultural sector to creating the third-largest startup ecosystem in the world, your contributions span across every sector of the economy,” said the Vice-President, adding that the IIT students “are the greatest spinal strength of this country”.

He also spoke about India’s determination to invest and foster an environment that will encourage technological development. He further expressed hope that India will soon become the third-largest global economy by 2030.

IIT Delhi Director Prof Rangan Banerjee, Deputy Director (operations) Prof TR Sreekrishnan, Deputy Director (strategy & planning) Prof Ambuj Sagar and Professor Narayanan D Kurur also attended the event.

**Admission to Master's Programme at IIT Delhi to End Soon, Check Details To Apply**


The classes for the masters and PhD programmes at the institute will begin from January 1, 2024.

The Indian Institute of Technology (IIT) Delhi will soon close registrations for admission to PhD and MS programmes for Semester 2.

Candidates can submit the online application and application fee by October 27, 2023. The submission for the same can be done by 4 pm on that day.

The students will be evaluated for the admission process based on a series of test and interviews that will be held from December 1-12, 2023.

The date of orientation and registration for new students will be conducted on December 30, 2023.

The classes for the master's and PhD programmes will begin from January 1, 2024.

**Eligibility criteria**

For pursuing a PhD programme, the candidates must have a degree in ME/MTech/MS/MD/MDes or equivalent. Students with a degree in BTech/BE, MSc/MA/MBA/MBBS can also apply if they have at least one year of work experience.
Admission to the PhD programmes is normally made on the basis of an interview of eligible candidates conducted by the Department/Centre/School concerned, through its Department Research Committee (DRC) / Centre Research Committee (CRC)/ School Research Committee (SRC). DRC/CRC/SRC may decide to conduct a written test as well, or multiple interviews, or other ways or testing, in order to screen the candidates.

Usually, PhD programmes are advertised in the month of March and October each year. Test and interviews are carried out in the months of May and December. Further, admission to the PhD programme is possible at any time of the year with the application being processed and candidates interviewed by the respective DRC/CRC/SRC. PhD scholars can join the Institute at any time of the year.

For further details candidates can visit the official website of IIT Delhi.

**IIT Delhi Collaborates With THDCIL to Conduct Research in Science, Engineering, and Technology**


The Indian Institute of Technology (IIT) Delhi has signed a Memorandum of Understanding (MoU) with THDC India Limited (THDCIL), a Central Public Sector Enterprise to conduct advanced research and development
activities in science, engineering, and technology. The MoU aims to conduct research studies, pilot projects, and consulting engagements led by faculty members. The agreement is set to span five years.

These collaborative efforts will include research studies in energy conservation, alternatives to lithium-ion storage batteries, nanotechnology for electric vehicle batteries, green hydrogen, geothermal technology, climate change issues, waste management/recycling, water management/conservation, vortex-induced vibrations, tunnelling techniques, biofuels, grid stability improvements, and various other pertinent fields, the institute said in a press release.

According to the MoU, IIT Delhi will offer essential infrastructural support and access to scientific, engineering, and technical expertise. These resources will be instrumental in facilitating R&D activities, aligning with the academic pursuits of the institute.

RK Vishnoi, Chairman and Managing Director, THDCIL, said the organisation will actively reach out to IIT Delhi to initiate collaborative projects and engage with research groups within the institution. “THDCIL has committed to providing comprehensive financial support for operational expenses and the cost of research and development activities. This support will empower IIT Delhi to continuously undertake R&D projects on mutually agreed terms, cementing their role as a knowledge partner in collaborative research efforts,” said Vishnoi.

IIT Delhi, with the backing of THDCIL, also aims to leverage its expertise to engage with national and international agencies. This engagement is aimed at both basic and translational research solutions. Additionally, the institute will involve more faculty members from relevant disciplines and disseminate the collaborative activities effectively.

“This collaborative venture between THDCIL and IIT Delhi represents a significant step forward in the fields of research, innovation, and technological advancement, with the potential to yield ground-breaking solutions for various industries and domains,” the THDCIL CMD stated.

IIT Delhi, TimesPro's artificial intelligence and machine learning immersion session marks successful completion of first batch


The AI and ML programme is contextually designed to bridge the gap between theoretical knowledge and practical application in the industry
The Indian Institute of Technology Delhi (IIT-D) and TimesPro's 'Artificial Intelligence (AI) and Machine learning (ML) for Industry Programme' celebrated a significant milestone with its inaugural batch concluded with the successful completion of its immersion session recently.

The batch with a strength of 58 learners underscored the programme's commitment to equipping professionals with the skills needed to excel in the rapidly evolving world of AI and ML.

The AI and ML programme is an exclusive offering from the Department of Yardi School of AI, IIT Delhi and is contextually designed to bridge the gap between theoretical knowledge and practical application in the industry.

With the aim of fostering innovation, enhancing employability, and nurturing future leaders in the field of AI and ML, the programme has already demonstrated its immense potential.

Sandeep Kumar, assistant professor, Department of Electrical Engineering and Yardi School of Artificial Intelligence and Manabendra Saharia, assistant professor, Department of Civil Engineering and Yardi School of Artificial Intelligence, IIT Delhi said, "We are delighted to witness the impressive growth and development of our learners. The immersion session is a testament to the programme's commitment to producing industry-ready professionals with strong foundational understanding who can drive innovation and
transformation in their respective fields. The programme's focus on practical skills development aligns perfectly with the industry's need for professionals who can make immediate contributions."

Mohan Silaparasetty, head of Technology Programmes, TimesPro said, “IIT Delhi-TimesPro's programme fills a crucial gap in the market for AI and machine learning talent. Graduates with practical experience and a deep understanding of these technologies are highly valuable to organisations seeking to harness the power of AI for innovation and growth. The knowledge sharing during the immersion session has given our learners deep insights on the next steps in their careers."

The immersion session showcased the programme's commitment to delivering tangible learning outcomes and benefits to its participants. It provided learners with a unique platform to connect with peers, industry professionals, and mentors. The completion of the immersion session marks a significant step for participants as they transition with new-age skills into the industry.

During the six-month programme, learners were exposed to a wide range of topics and hands-on experiences where they gained skills in mathematical foundations of machine learning, design and implement AI solutions, analyse data, and leverage machine learning algorithms to effectively mitigate real-world industry challenges. Learners had the chance to work on real AI and machine learning projects, gaining practical experience that is highly sought after by employers. These projects showcased their ability to apply their knowledge to real-world scenarios.

**IIT Delhi to Host Four-Day Winter School on Theoretical Computer Science in December**

**October 19, 2023**  [https://www.campusvarta.com/article/iit-delhi-to-host-four-day-winter-school-on-theoretical-computer-science-in-december](https://www.campusvarta.com/article/iit-delhi-to-host-four-day-winter-school-on-theoretical-computer-science-in-december)

The Indian Institute of Technology Delhi (IIT Delhi) is set to organise a four-day winter school, aimed at providing participants with insights into various research areas within Theoretical Computer Science. Scheduled to take place from December 11, 2023, to December 14, 2023, the event will be held on the IIT Delhi campus. This educational endeavour will feature lectures delivered by a diverse group of faculty members, covering a wide array of topics, including Algorithms, Computational Social Choice, Communication Complexity, Security Protocol Verification, and more. Participants can also look forward to tutorials, interactive activity sessions, and opportunities for informal discussions with both faculty members and graduate students from IIT Delhi.

Applications for the winter school are currently being accepted. Interested pre-final and final-year undergraduate students and masters students can apply by October 31. Selection for the programme will be
based on academic performance and a brief statement of interest, with approximately fifty students to be shortlisted.

Furthermore, participants of the winter school will have the opportunity to pursue a summer internship with CSE (Computer Science and Engineering) faculty members. The Internship is scheduled for the summer of 2024, and participants will receive a stipend to support their accommodation and living costs while staying in the IIT hostel.

For more information and to apply, interested individuals can visit the official IIT Delhi website.

**IIT-D launches online HR mgmt course**

*October 15, 2023*  

Indian Institute of Technology Delhi has launched an online 'Executive Programme in Human Resource Management' in view of the changing landscape for professionals. The deadline to apply for the 8-month course is October 24 and it is set to commence from January 13, 2024.

Offered by Continuing Education Programme, it blends theoretical knowledge with practical application, enabling professionals to make data-driven decisions, optimise talent acquisition, nurture employee development, and align HR initiatives with organisational goals.

**DAKSH Centre of Excellence for Law and Technology at IIT Delhi Launches a Book Titled ‘Technology and Analytics for Law and Justice’**

*October 13, 2023*  

Book to help researchers, policymakers, government agencies, law firms, legal practitioners, students and more  • Book aims to map the landscape of and provide insights into the application of Technology and Analytics to the law and justice space

The DAKSH Centre of Excellence (CoE) for Law and Technology at IIT Delhi launched a book titled ‘Technology and Analytics for Law and Justice’ on Friday. The book was launched by Hon’ble Mr. Justice Rajiv Shakdher, Delhi High Court.

IIT Delhi’s Prof. Nomesh Bolia, Coordinator, DAKSH CoE, and Mr. Surya Prakash BS, Fellow and Programme Director at DAKSH, Bengaluru, have edited the book.
This book is a unique volume from the DAKSH CoE and examines the evolution of technology in the law and justice system in India. It delves into the challenges and opportunities presented by technology, current thinking on the subject, and what the future may hold for this rapidly developing field.

Chief Guest, Mr. Justice Rajiv Shakdher, said, “The publication of this book is timely, given technological tsunami that world is faced with today. Data driven innovation is the way forward and this book makes a case for adoption of such approach with all emphasis at its command.”

From tracing the historical journey of law and technology in India to the rise of ‘justicemakers,’ the impact of cutting-edge forensic technology, the world of smart contracts, and the realm of surveillance, this book offers a comprehensive and thought-provoking look at the ever-changing landscape of law and technology.

Mr. Surya Prakash BS, Fellow and Programme Director at DAKSH, Bengaluru, and one of the editors of the book, said, “This book has come out at a crucial time since Phase III of the e-Courts project is underway with its emphasis on building digital public infrastructure and citizens experiencing justice as a service.”

The book will be helpful to a broad audience, including researchers, policymakers, government agencies, technologists, law firms, legal practitioners, academics, and students looking for a head-start in transforming law and justice systems.

Prof. Nomesh Bolia, the editor of the book, said, “As the digital age reshapes India’s legal framework, this book serves as an indispensable guide to navigating the future of the justice system in our tech-driven society.”

The book is divided into four sections: Access, Assistance, Analytics and Institutionalisation. It seeks to answer the following questions:

• What has been the trajectory of technology adoption in India’s law and justice systems?
• How do communities perceive this, and what are their needs and expectations?
• What questions are innovators in the space working on? What needs to be solved to take the ecosystem to the next level?
• How can institutions embed these innovations into their practices?

The curated volume contains insightful chapters from leading thinkers in the space such as BK Agarwal, Vikramjit Banerjee, Sachin Malhan, Nikhil Narendran, Harsh V Pant, Santosh K Misra, Susan Thomas, Bhargavi Zaveri, Murali Neelakantan, Ashish Kulkarni, Joseph Pookat, Prachee Mishra and from leading organisations...
such as IIT Kanpur, IIT Kharagpur, Rashtriya Raksha University, IIM Ahmedabad, IISER, Jindal Global Law School, Aapti Institute, Digital Futures Lab.

The launch event organised at IIT Delhi witnessed a panel discussion also with Hon’ble Justice Rajiv Shakdher, Prof. Nomesh Bolia and Mr. Surya Prakash BS as participants.

**IIT Delhi’s new wearable pressure sensor to help correct posture**


Researchers at Indian Institute of Technology (IIT) Delhi have developed a scalable and wearable pressure sensor that can potentially provide an easy, low-cost alternative to expensive footwear modifications, surgeries, and posture correction accessories.

Researchers at Indian Institute of Technology (IIT) Delhi have developed a scalable and wearable pressure sensor that can potentially provide an easy, low-cost alternative to expensive footwear modifications, surgeries, and posture correction accessories.

- The new sensor is based on a nanocomposite material, that has unique combination of light-sensitive polymer and piezoelectric nanoparticles, which offers the advantage of easy array design for pixelated
sensing over large area, simple process flow, and low-cost implementation for human movement monitoring and injury rehabilitation.

In a study published in the journal Nano Energy, the researchers reported the sensor as fully flexible that can be implemented as a sensor array considering a robust design that comfortably fits inside the insole of varying sizes.

It can also be easily attached at the palm or any body part where localised pressure sensing can be useful. The use of dual transduction nanocomposite material in the proposed sensor allows concurrent sensing of mechanical strain as well as contact force/pressure that helps in easy integration with current Machine Learning algorithms by providing higher feature elements.

“The integration of sensors and Machine Learning leads to the invention of intelligent sensors for cutting-edge technologies in fields like healthcare, sports science, defence etc,” said Dr Dhiman Mallick, lead researcher and Assistant Professor at Electrical Engineering Department, IIT Delhi, in a statement.

“During the number of tests that we conducted in our laboratory, we found that the proposed sensor can potentially help detect foot problems in adults and children by analysing the pressure variation on the back end of the foot and converting it into electrical output. Since abnormal hind foot pressure distribution can lead to problems in knee joints, hips, and even spine-related injuries, understanding and correcting it is an important application,” Mallick added.

The sensor generated output is analysed by conventional Machine Learning models and linked to a person’s walking behaviour. By comparing the pressure patterns to those of predefined patterns of a normal person, clinical specialists can conclude the type of deformity present.

“The resulting pressure patterns can aid doctors and specialists in designing custom insoles that balance out the foot deformity by supporting regions of the foot showing abnormal pressure distribution. In effect, the proposed sensor can potentially provide an easy, low-cost alternative to expensive footwear modifications, surgeries, and posture correction accessories”, Mallick further said.

In addition, the sensor can help in understanding different human activities, like walking or running by feeling the pressure changes in the user’s hind foot.

This can have tremendous application in smart healthcare systems wherein the activity pattern, exercise intensity, number of steps, etc., form important parameters for critical health analysis in people with diabetes, obesity, etc.
The sensor can also be helpful for elderly fall detection, especially in patients with Parkinson’s disorder or who are disabled and aid in injury rehabilitation.

AI takes JEE (advanced) test, does well... but not enough for IIT seat


The findings come at a time when AI-based tools are showing promise in cracking tests, raising questions about what it holds for the future of work

An artificial intelligence (AI) module, based on the model underpinning ChatGPT, scored well enough to be in the 80-90 percentile of India’s one of the toughest engineering college admission tests but did not fare well enough to clinch scores that would secure a seat in the premier Indian Institute of Technology (IIT) colleges, an experiment by IIT-Delhi researchers has claimed.

The researchers said that GPT-4 got around 35 percent of the questions right, which would put it somewhere in the top 80 to 90 percentile of students. (Representational image/Reuters)

The findings come at a time when AI-based tools are showing promise in cracking tests, such as the American graduate eligibility test SAT, and the quantitative Graduate Record Examination (GRE), raising questions about what it holds for the future of work, once powerful tools such as these become widely adopted.
The experiments with the joint entrance exam (JEE) advanced offer new insights about what such systems, called large language models (LLMs), can achieve, and struggle with.

“GPT-4 got around 35 percent of the questions right, which would put it somewhere in the top 80 to 90 percentile of students. It would have to be in the top 90-100 percentile in order to get into an IIT... It’s almost there,” said Daman Arora, one of the researchers, who was pursuing MTech at IIT-Delhi’s computer science department along with his colleague Himanshu Gaurav Singh when they collaborated on the project. Professor Mausam, a computer science professor at IIT-Delhi and the founding head of IIT’s Yardi School of artificial intelligence, oversaw this research.

To give the AI model the challenge, the duo created JEE Bench, with 515 pre-engineering mathematics, physics, and chemistry problems from the past eight editions of the IIT JEE-Advanced Exam.
The tests showed that GPT-4, the latest version of the LLM, performed better than all older versions. The paper said that while GPT-3 had “near random performance”, GPT-3.5 could solve 30% of the questions. GPT-4 performed well with physics and chemistry questions but struggled in “retrieving relevant concepts required to solve the problem and performing algebraic manipulation and arithmetic”.

This is probably because the complexity of reasoning is highest in mathematics and least in chemistry, noted the paper. “The typical failure modes of GPT-4, the best model, are errors in algebraic manipulation, difficulty in grounding abstract concepts into mathematical equations accurately and failure in retrieving relevant domain-specific concepts,” noted their paper, which is yet to be peer reviewed.

Another issue that AI might face in comparison to humans while writing the test is risk evaluation, said the researchers. The exam contains negative marking; the candidate is awarded a score of +3 for a correct answer, -1 for an incorrect one, and zero when not answered.

A preliminary version of the research paper titled — Have LLMs Advanced Enough? A Challenging Problem Solving Benchmark For Large Language Models — has been submitted to conferences.

The updated paper will be presented at the Empirical Methods in Natural Language Processing conference in Singapore in December.

To be sure, LLMs do not have reasoning capabilities. “Let’s be clear: An LLM does not create any new truths; they are architecturally incapable of abductive reasoning. LLMs only generate statistically interesting strings of words that are surprisingly coherent yet untethered to any metric for truth,” wrote noted American computer scientist Grady Booch, in a post on Twitter (now X), in March this year.

Professor Mausam, who goes by just one name, said that AI is getting closer to cracking entrance tests such as JEE by the day.

He said, “In a similar study, we tested how well it could perform on material science related questions in GATE, the Master’s entrance test, and it performed rather well.”

OpenAI, when it released GPT-4, said: “GPT-4 exhibits human-level performance on the majority of these professional and academic exams. Notably, it passes a simulated version of the Uniform Bar Examination with a score in the top 10% of test takers”.

21
With AI making its way into allied sectors, and chatter of AI being used by students to cheat, two other IIT professors decided to test whether AI could help students with their class assignments, in February-March this year.

Professor Ishaan Gupta, assistant professor, department of Biochemical Engineering and Biotechnology at IIT-Delhi, said: “I asked students in March to take the help of AI, to frame a code to solve a problem in the field of Bioinformatics. I found that it reduced the time it took for students to finish the assignment. Once they had the framework, they could take on slightly more challenging tasks.”

He added that AI can be used in the field, as a tool to increase efficiency as his students are not coding every day and might not be familiar with the syntax.

They used Open AI’s GPT-4, a multimodal model that accepts image and text inputs and emits text outputs.

**IIT-Delhi achieves record-breaking quantum communication, advances cybersecurity**

October 6, 2023  [https://www.indiatoday.in/science/story/iit-delhi-achieves-record-breaking-quantum-communication-advances-cybersecurity-2445084-2023-10-05](https://www.indiatoday.in/science/story/iit-delhi-achieves-record-breaking-quantum-communication-advances-cybersecurity-2445084-2023-10-05)

The team managed to maintain an impressively low Quantum Bit Error Rate (QBER), making the quantum communication resistant to collective and individual attacks.
Quantum physics aims to study matter and energy at the most fundamental level.
Quantum communication provides security guaranteed by the laws of Quantum Physics.
This is the longest distance achieved globally.
Researchers from the Indian Institute of Technology (IIT) Delhi have successfully demonstrated secure quantum communication over a distance of 380 kilometers in standard telecom fiber.
This is the longest distance achieved globally for the Differential Phase Shift (DPS) Quantum Key Distribution (QKD) protocol, marking a significant milestone in the field of quantum technologies.
The research, led by Associate Professor Bhaskar Kanseri from IIT-Delhi's Physics Department and Optics and Photonics Centre, has been published in the "Nature Scientific Reports" journal.
The team managed to maintain an impressively low Quantum Bit Error Rate (QBER), making the quantum communication resistant to collective and individual attacks.
"This technology can revolutionise the field of cybersecurity," said Kanseri. "It is capable of securing network communication such as Internet of Things (IoT) and can be implemented for various applications, including securing financial transactions, medical records, and secret codes."

This technological breakthrough was achieved over a commercial-grade optical fiber. (Photo: Getty)
What is Quantum Communication?

While quantum physics is a field of science that aims to study matter and energy at the most fundamental level, quantum communication is one of the safest ways of connecting two places with high levels of code and quantum cryptography that cannot be decrypted or broken by an external entity.

Quantum communication provides security guaranteed by the laws of Quantum Physics, which cannot be broken even using a quantum computer.

The successful demonstration of QKD by the IIT-Delhi team eliminates the need for intermediate trusted nodes, which are often considered weak security loopholes and are vulnerable to several kinds of attacks.

"This QKD demonstration paves ways for more secure long-distance communication useful for strategic areas such as defense and online banking, making digital transactions safer in the near future," Kanseri told PTI.

Previously, a similar technological breakthrough was achieved over a commercial-grade optical fiber already available in the field in 2022 by IIT-Delhi and the Defence Research and Development Organisation (DRDO). The performance parameters were found to be within the reported international standards at sifted key rates of up to 10 KHz.

The successful demonstration of this technology marks a crucial step towards the commercial production of long-distance secure practical QKD devices, further strengthening India's position in the global quantum technology landscape.