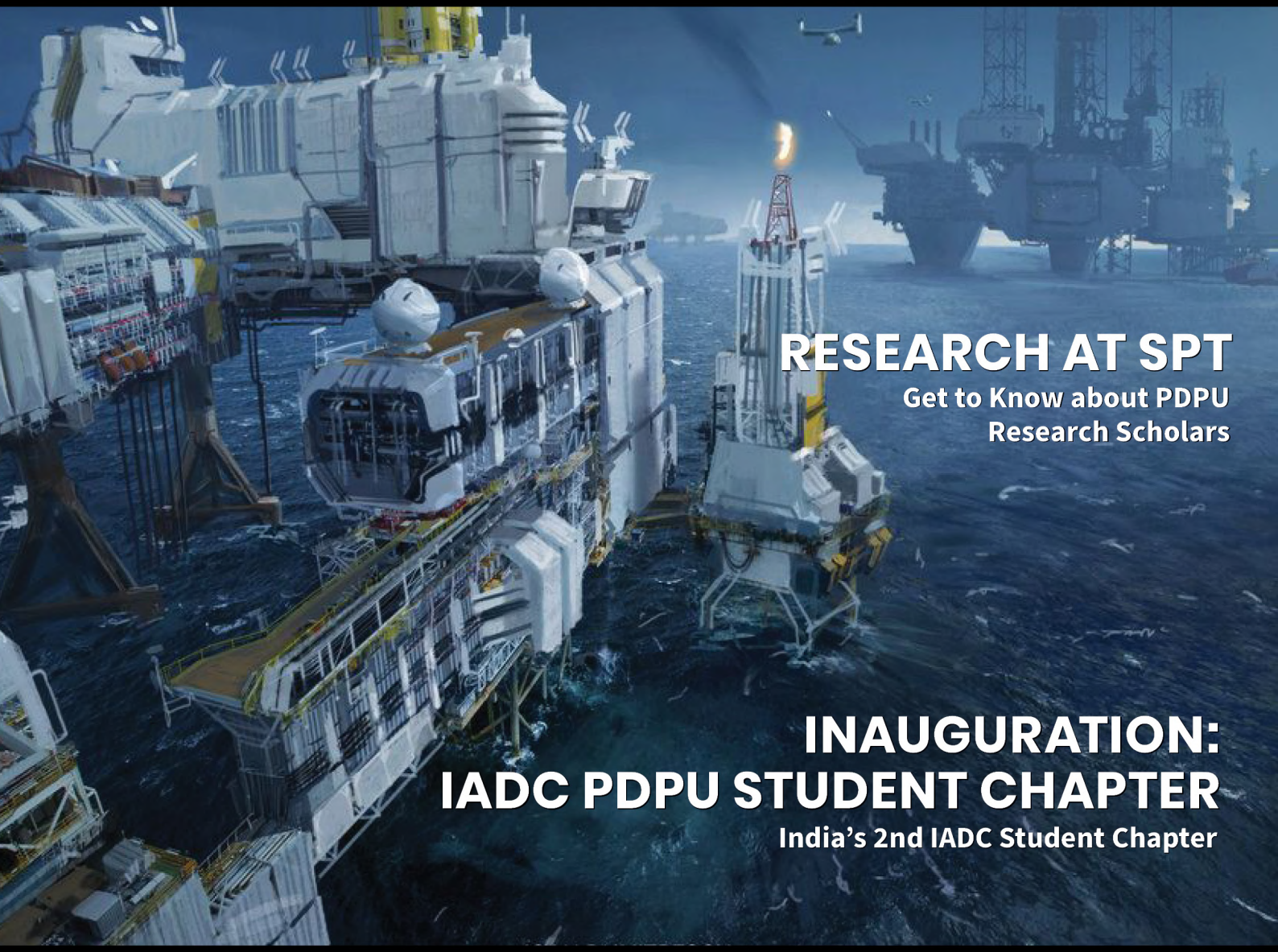
SPT Mirror

October 2020

THE OFFICIAL MAGAZINE OF SCHOOL OF PETROLEUM TECHNOLOGY



RESEARCH AT SPT

Get to Know about PDPU Research Scholars

INAUGURATION: IADC PDPU STUDENT CHAPTER

India's 2nd IADC Student Chapter

VIRTUAL CLASSES

Learning in COVID-19 times

SCHOOL OF PETROLEUM TECHNOLOGY HOPES THAT YOU ARE STAYING HEALTHY AND SAFE DURING COVID-19

cover page courtesy: www. nationspace.net

From the Editor's Desk

Dear Readers,

I'd take this opportunity to welcome you to the October edition of SPT Mirror, the official magazine of SPT PDPU. This time challenges were different, the current pandemic has changed the work culture and the way we communicate. Over time we all have adjusted to the changing environment and have started moving forward. It is the proactive approach of all the team members which has made this issue successful.

The present edition incorporates all the exciting events organized virtually by different student chapters and events sustained by the university. The inauguration of the IADC student chapter, 2nd IADC chapter of India is a must-read story describing the strong dedication of PDPU students and staff members to excel in every situation. Readers will also get the opportunity to know about the scholars working with the SPT department and the ongoing researches.
I wish this edition too is as enlightening and informative as the previous ones.

Take care and stay safe,
Happy Reading!!

Mrs. Namrata Bist Rawat

From the Director's Desk

Dear students,

Greetings to all students and faculty members, I am elated to convey that PDPU has successfully streamlined all the classes to online mode. Many successful events have been organized virtually by different college societies providing students a unique opportunity to learn, grow, and network with their colleagues as well as leaders in the oil and gas sphere. I am happy to announce that we recently inaugurated India's 2nd IADC Student Chapter at our university. Students should use this opportunity and join the chapter to make the events successful.

SPT Mirror is providing the platform for students to communicate from their home, know about various events, fests, and reflect upon the achievements of the college. I also would like to cordially congratulate the team of SPT Mirror for another successful edition. I hope you all are enlightened and enjoy reading this issue as well.

Regards
Dr. R.K Vij
Director
School of Petroleum Technology.


Nikhil Ranjan


Sanjeev Singh


Vrutang Shah


Aman Sharma


Amoghbrata Bhattacharya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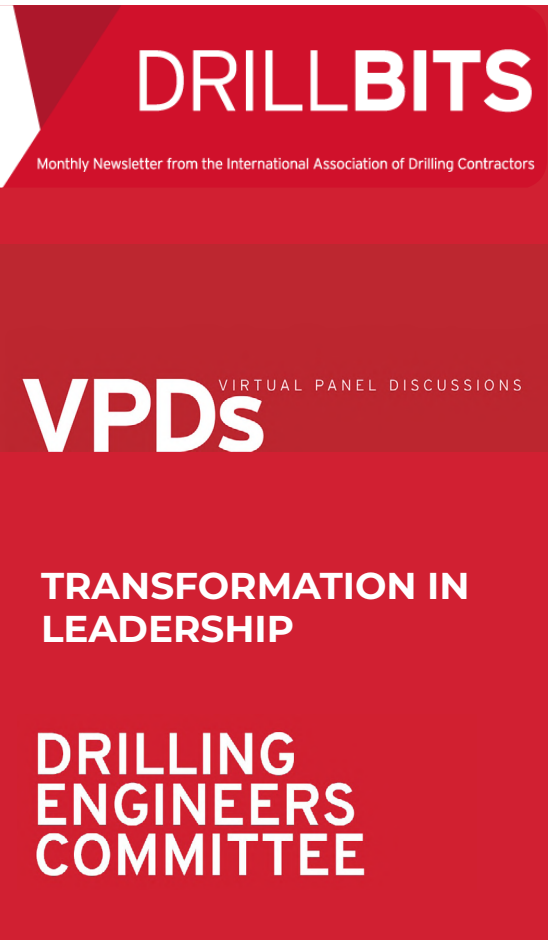
Inaugural of IADC Student Chapter

- By Nikhil Ranjan

28th September 2020 marked the beginning of a new venture of School of Petroleum Technology, PDPU as the International Association of Drilling Contractors (IADC) student chapter was inaugurated. It is only the 2nd student chapter of IADC in India after MIT Pune IADC Student Chapter and 9th across the globe. The IADC student chapter provides a means for students to connect to global IADC activities, drilling industry professionals, and the industry as a whole.



Owing to the restrictions on gathering in the wake of the current pandemic situation the ceremony was organized on Microsoft Teams virtual platform by the faculty mentors Dr. Hari Sreenivasan and Mr. Gaurav Hazarika along with the newly elected chapter officers. The distinguished guests for the function were Mr. O.P Singh, Director ONGC (T&FS), Mr. Arun Karle, President, Askara Group, Mr. Mike Dubose, Vice President, IADC International, Mr. Lars Jorgensen, Director, IADC, Europe, Mr. Hisham Zebian, Vice President, Eastern Hemisphere, IADC, Abu Dhabi, Dr. S. Sundar Manoharan, Director General, PDPU, Dr. R. K. Vij, Director SPT, PDPU, Dr. Subhash Shah, Shell Chair Professor, SPT, PDPU along with honourable members from IADC South Central Asia Chapter, MIT Pune Student Chapter and all other IADC chapters worldwide. The event was also graced with the presence of some of the leading figures in the oil and gas industry like Mr. U N Bose, Mr. Aniruddha Pattnaik, Mr. Kanchan Kumar, Mr. S. C. Soni, Mr. Ajit Kumar Hazarika, and many more.

Mr. Mike Dubose initiated the event with his welcome address followed by Mr. Arun Karle, who formally welcomed all the dignitaries and students present on the virtual dais. Mr. Dubose briefed about IADC along with its mission and vision statements. He described the role of the IADC Student Chapter initiative which includes engaging in global activities, networking with industry professionals and most importantly, exposure to the practical side of this business which cannot be fulfilled via classroom education only. Finally, he declared the IADC PDPU Student Chapter open, which was received by a round of applause on the virtual platform.

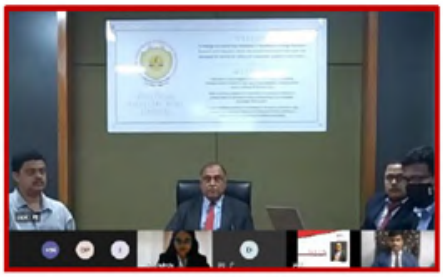
Dr. S. Sundar Manoharan (Director General, PDPU) in his address, lauded this proud moment as another feather in the cap of PDPU. He stated that he looks forward to having active collaboration with IADC. In his

address, Dr. R. K. Vij (Director SPT, PDPU) mentioned PDPU being a university with difference stressed on the need for students to associate themselves with organizations like IADC. At last, he welcomed every dignitary present to visit the PDPU campus once the restrictions would be uplifted. Dr. Subhash Shah (Shell Chair Professor, SPT, PDPU), from his illustrious industrial and academic experience, said that further research is required in the field of drilling for optimization and cost reduction. He added that how the association with IADC will be fruitful for the students as well as faculties with the number of opportunities being provided but it would be up to the students themselves to grab them.

This was followed by the faculty mentors Mr. Gaurav Hazarika and Dr. Hari S addressing the event talking about the way forward for the IADC student chapter at PDPU as well as announcing the executive committee members of the student chapter for the year 2020-21. Later Parag Bhoraniya (Chairman, IADC PDPU SC) and Smit Prajapati (Vice-Chairman, IADC PDPU SC) addressed the event extending their vote of thanks to all the dignitaries, participants and guests and the event ended around 20:00 IST.

The program was a grand success as over hundred participants were present for this ceremony. It was enlightening and inspiring for students as they also came to know about the benefits of the student chapter as well as some of the upcoming opportunities such as IADC Well Control Conference as well as the IADC Middle East Drilling Conference. Inauguration of this student chapter is an example of how PDPU continues to strive towards excellence and providing better opportunities for its students even in these challenging times. We can expect that the IADC student chapter will organize many thought-provoking events that help students in better practical understanding of the drilling industry in the future.

Dr. S Sundar Manoharan
Director General, PDPU



Dr. R. K. Vij
Director SPT, PDPU

Dr. Subhash Shah
Shell Chair Professor, SPT, PDPU

Mr. Arun Karle,
President, Askara Group

Mr. Mike DuBose,
Vice President, IADC

Virtual Inauguration of IADC PDPU Student Chapter

IADC
PANDIT DEENDAYAL PETROLEUM UNIVERSITY STUDENT CHAPTER

Student Chapter Events

SEG-SPG-EAGE Student Chapter

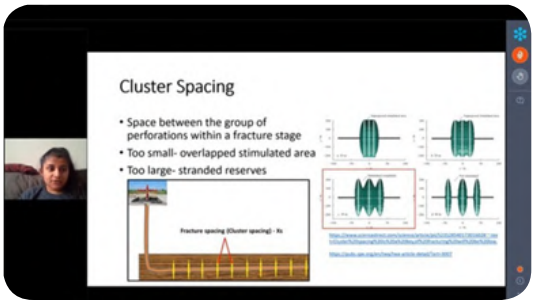
Compiled By: Aman Sharma
Edited By: Sanjeev Singh

Webinar on "ROAD TO GATE"

SEG-SPG-EAGE PDPU Student Chapter organized Webinar on "ROAD TO GATE" in collaboration with Petrogyaan by Mr. Vivek Thakar (Production Engineer, ONGC). He had given important and time-saving tips to the participants. He had also shared his experience of GATE and asserted to have positive thoughts in mind at the time of examination. He had solved all questions raised by participants and also cleared all their doubts regarding the GATE examination. The session was encouraging, inspiring, and informative.

Webinar on "Stimulation techniques in Reservoir"

SEG-SPG-EAGE PDPU Student organized Webinar on "Stimulation techniques in Reservoir" on 2nd August 2020 by Ms. Yogashri Pradhan(Senior Reservoir Engineer, USA). Ms. Yogashri Pradhan began the lecture by giving us a brief introduction about various Stimulation techniques in the reservoir. She presented her insights which included unconventional hydrocarbon resources, mechanical isolators, stress orientation significance in hydraulic fracturing, sand and fluid volume, types of proppants, and also case studies from American fields. The session provided theoretical as well as practical knowledge of the topic.



Guest Lecture: Managing Down-hole Losses in E&P operations

Down-hole losses during drilling operation is a serious problem affecting the drilling time and productivity adversely while increasing the well cost. As a part of SEG week 4.0, the SEG-SPG-EAGE PDPU student chapter organized the event "Managing Down-hole losses in E&P Operation "on 20 August 2020 by Dr. Milap Goud currently working as the chairman and managing director of the "Knnamp drilling fluid services Pvt Ltd ".

Dr. Milap Goud explained different criteria to be kept in mind while designing drilling fluid and cement slurry design. He presented his insights which included the causes of down-hole losses, preparing to cure the loss, managing down-hole losses, and prevention and planning required for handling these losses. He concluded the session sharing guidance for upcoming engineers based on field operations.

Covid envision

As a part of SEG week 4.0, SEG-SPG-EAGE PDPU Student Chapter organized "COVID Envision -Report Making Competition" released on 17th august 2020. The event focused on testing the data analysis of the participants.

The theme for the competition was "How COVID-19 Affected Petroleum Industry ".The participants were provided with one week to present their reports. The participants brought up their reports showing statistical as well as graphical data of their respective companies to convey the effect of COVID-19 on industries.

SEG SOCIETY OF EXPLORATION GEOPHYSICISTS
STUDENT CHAPTER EAGE PANDIT DEENDAYAL PETROLEUM UNIVERSITY
PDPU STUDENT CHAPTERS

Technicaza

As a part of SEG week 4.0, SEG-SPG-EAGE PDPU Student Chapter organized "Technicaza-Online quiz competition" on the 21st of August 2020. The quiz focused on the fundamentals of reservoir engineering as well as an understanding of the basics of the Oil and Gas industry.

The questions were based on theoretical as well as practical aspects of reservoir engineering. The questions were designed to test the knowledge regarding the reservoir engineering field as well as keeping in mind the agility required to excel beyond others. The quiz was met by many enthusiastic petroleum engineering aspirant students.

Case Ablaze | Case study solving competition

As a part of SEG week 4.0, the SEG-SPG-EAGE PDPU student chapter organized "Case Ablaze-Case Study solving Competition" which was released on the 17th of August 2020. The competition provided a means to test the problem-solving skills of petroleum engineering aspirants by examining the specific case and develop the most effective solution.

The aspirants were provided with one week to solve the Oil & Gas industry problem. The participating teams brought up their solutions by analyzing the given situation, evaluating a logical approach for the given situation, and providing a reasonable justification for the selection of the approach. The entries were judged by the precision of their solution as well as interpretation of data, explanation of the solution, and the reasonability of the solution. The competition helped in providing an exuberant platform to budding petroleum aspirants to experience a real field problem.

Covid Block And Tackle | An Extempore Speech Competition

As a part of SEG week 4.0, the SEG-SPG-EAGE PDPU student chapter organized "Block and tackle" on the 22nd of August 2020. This was an extempore speech competition where the participants were provided with a topic, and they have to deliver a speech for a specific duration of time.

The event intended in providing an experience of spontaneous interactions, building speaking skills, and gaining more knowledge of the topics. Judgment was done based on humour, content, spontaneity, and relevance of the topic.

SPE PDPU Student Chapter

Reported By: Shreyansh Jain
Edited By: Sanjeev Singh

Webinar on "SUBSURFACE DATA MANAGEMENT"

SPE PDPU Student Chapter organized a webinar on "Subsurface Data Management" which was delivered by Ms. Sushma K. Bhan, Chief Data Officer, Shell Informational Technologies, Houston. As a Principal Technical Expert of data, she is accountable for Reservoir Engineering, Well Engineering, and Production Technology global data standards, their implementation across assets, and people development. Ms. Bhan shared her insights on enabling the journey of digitalization in the upstream by the means of data. She discussed the strategic objectives such as establishing digital governance, implementation of effective data governance, improving data literacy, and digital mastery to supplement the same. Alongside this, she also threw light on the fundamental global challenges that this poses such as difficulty in accessing technical data and lack of robust global discipline data ownership, particularly of multidisciplinary data. The session along with being informative was also interactive. Ms. Bhan addressed students' questions and cleared their doubts regarding the standardized data management steps, its impacts, and the challenges faced due to it. The primary purpose of this session was to utilize the students' time in a benefiting way during their time at home and provide students with extensive knowledge.

Guest Lecture by Dr. R. K. Vij

SPE PDPU Student chapter is delighted to host the online webinar on the topic "Impact of Covid-19 on the oil & gas industry". This webinar was hosted by the honorable director of the School of petroleum technology PDPU, Dr. R.K.Vij. He has 20+ years of experience in the Oil & Gas industry and has published several research papers. This online webinar had witnessed zealous participation from many universities across the world. This webinar covered all the important aspects of the oil & gas industry which includes all the technical aspects like staring from the work station to the marketing of the oil & gas. Analyzing the Covid-19 situation many countries, economies, and governments had faced numerous problems to recover from the pandemic state. The oil & gas industry had seen an extremely volatile phase with the oil prices plummeting to an all-time low. In this session, he had mainly focused on the Indian scenario of the oil & gas industry, and meticulously pointed out every aspect in all the sections. He also discussed the spending plans of IOS's (International oil companies) and NOC's (National oil companies) on producing oil & gas due to the pandemic. This session had been very interactive and the webinar was ended by a Q&A session with a very interactive question which was very beneficial for the students as well the industrial experts.

Guest Lecture by Mr. Joy Varghese

SPE PDPU Student Chapter always aimed to make its affiliates updated to the current scenario of the world and hence, organized a guest lecture on 'Post COVID-19 Career Activities in Oil and Gas Sector'. All the senior faculties of different universities along with Dr. RK Vij, Director, School of Petroleum Technology, PDPU were invited. The chief guest for the event was Mr. Joy Varghese, Managing Director, RigTech Oilfield Training Center. The fruitful event was initiated by a brief speech on the challenges and achievements sweet-faced by the oil and gas industry due to the COVID-19 pandemic. Every discussion that happened was engaged with the fact of the future scope of budding petroleum engineers and the adverse effect on the job market in the industry due to the pandemic. Later, the speaker also discussed what all fields can everyone prefer to get into the petroleum industry. Around 100 students from different universities all over actively participated in the event and cleared their doubts. On completion of this our faculty mentors, Dr. Bhawanisingh Desai and Mr. Jatin Agrawal gave a vote of thanks for the event.

SPE WEEK 15.0

Day 1 – Masquerade: Online Mask Designing Event

Amidst the ongoing pandemic, there has been a radical change in our lifestyle. Wearing masks has become the new normal. SPE PDPU organized Masquerade: Mask Making Initiative as a part of SPE Week 15.0, to hone the creative caliber of the participants and provide a rostrum to showcase their creativity. The event aimed at raising awareness about the importance of wearing masks and their uses. The event witnessed zealous participation from various national and international universities. Both handmade and graphic-based designs were accepted. The parameters to judge the masks designed by the students were creativity and clarity of the design. The winning entries were published on our social media handles.

Day 2 – EnhanCV: Workshop on Anatomy of a CV

As a part of the SPE WEEK 15.0 | HR SUMMIT, SPE PDPU Student Chapter organized "EnhanCV: Workshop on Anatomy of a CV", an acquainting session given by Dr. Harmik Vaishnav, Associate Professor at School of Liberal Studies, PDPU. The target of the webinar was to bring out the frequent mistakes done by the students while drafting their CV and to enlighten them with some fundamental points which could help their CV look attractive. A few of these insights were "to elaborate on your education, co-curricular activities, internships, to highlight your strengths, achievements, USP". Dr. Harmik Vaishnav emphasized the advantage of a better CV. He also gave some valuable insights into HR questions. The webinar was followed by an interesting question & answer session. It was an informative and interaactive session which focused on the ordinary mistakes made by the aspirants while drafting their CV followed by tips to make a CV look decent, and why it is crucial in the professional life of an individual.

Day 3 – Inquisite 3.0: The Aptitude Test

On the third day of the week "Inquisitive 3.0: The Aptitude Test", the students were tested through head-scratching questions and puzzles. An aptitude test is a systematic means of testing a student in his pace of solving problems. The test was held on MySwots.com and consisted of 30 questions which had a standardized method of administration and solving. This event tested the students' logical thinking and problem-solving skills schematically. With a huge number of participants, this event had been challenging and brought out the best from them. Aptitude tests helped them realize the importance of logical thinking and the speed in solving the questions helped in enhancing the skills and prepare for the interviews effectively. The test left a remarkable impression on the students motivating them to crack different types of real-life problems in a feasible manner.

Day 4 – Quizard 2.0: The Technical Test

As a part of SPE Week 15.0 | HR Summit, the chapter organized 'Quizard 2.0' - The Technical Test in association with MySwots.com. This event was aimed to render a perfect podium to showcase the participants' prowess in technical knowledge and general aptitude related to the oil and gas industry. The head-scratching quiz consisted of questions from all the nooks and corners of the oil and gas industry. There were 30 questions in totality which had to be answered correctly in a stipulated time. The problems were a combination of theoretical and numerical based questions. The quiz tested the budding engineers' knowledge quotient and their fundamental awareness of the industry. The event saw huge participation from the national as well as international universities. The winners were evaluated based on the time taken and marks obtained in the quiz.

Day 5 – Interview Etiquette: How to Behave in an Interview

Getting selected in a stressful interview doesn't come naturally to most. High-pressure meetings, with someone we don't know, asking questions we don't necessarily know the answer to, are bound to feel plenarily eccentric. In such a situation behavior and body language plays a consequential role in determining the result of the interview. On that note as a part of SPE WEEK 15.0 | HR Summit SPE PDPU organized 'Interview Etiquette: How to Behave in an Interview' by Dr. Bhavini Upadhyay, Visiting Lecturer at MLW, Gujarat University. The Chapter was delighted to host such an experienced and cognizant person. The lecture was concretely focused on how to behave in an interview, what should be the body language, posture, and how to remain calm in stressful situations. Dr.Bhavini Upadhyay commenced the lecture with a short briefing session on CV, how to write it, and keep it up to date. Then she briefly explained rudimental etiquettes and mistakes that candidates often commit. In the concluding note, she discussed further situations that one might get into and also deliberated about how to deal with it. After her presentation got over, she elucidated the queries of the attendees. The session was immensely informative and interactive.

Day 6 – Interviewopolis: The Mock Personal Interview

SPE PDPU Student Chapter organized Interviewopolis: The Mock Personal Interview session as a part of SPE Week 15.0 | HR Summit. The session was a simulation of a personal interview, held online on Microsoft Teams. Interviewopolis was the final and most significant event of the week. The students selected for this round not only proved their abilities in the technical quiz and aptitude-based quiz but also actively participated in all the events during the week. The session was divided amongst 5 panels consisting of highly qualified industrialists who interviewed and judged the students. The primary purpose of this session was to utilize the students' time in a benefiting way during the lockdown and provide them with extensive knowledge and an opportunity for personal development from the comfort of their homes. The session was highly interactive and instructive.

Oil-O-Nomics: Impact of Exploration Activities on the Financial Statements of Oil and Gas Companies

The objective of oil and gas operation is to find, extract, refine, and sell oil and gas, refined products, and related products. The main objective of holding petroleum reserves is to generate future cash flows when they are extracted from oil and gas reservoirs and subsequently monetized. Exploration, development, and production often take place in joint ventures to share the substantial capital costs to ensure higher profits. The Chapter was delighted to host Mr. Saket Modi, Founder and Director of London based Square Mile Global Consulting Company. He delivered a webinar on the "Impact of Exploration Activities on the Financial Activities of Oil and Gas Companies." He talked about the upstream activities which make a significant effect on the financial statements such as the development expenditure, borrowing costs, depreciation of upstream assets, and the production sharing contracts. The sector-wide considerations included Royalties, leases, impairment of assets, and decommissioning. He concluded the webinar with a small note on the impact of Covid-19 on the global oil and gas industry. The session along with being informative was also interactive. Mr.Saket addressed students' questions and cleared their doubts regarding accruals and, its impact on the financial health of the company. The webinar enabled the attendees to understand the financial implications which explorational activities have on the companies.

Pandit Deendayal Petroleum University
SPE Student Chapter

FIPI PDPU Student Chapter

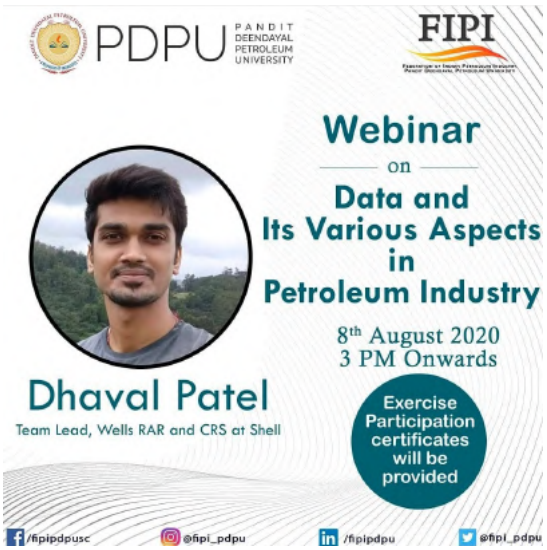
Compiled By: Aman Sharma
Edited By: Sanjeev Singh

The nationwide lockdown held everyone away from the routine life and daily academics. To make this period constructive yet keep everyone stimulated during the predicament, FIPI PDPU student chapter hosted various webinars and workshops by the respected alumni of our University.

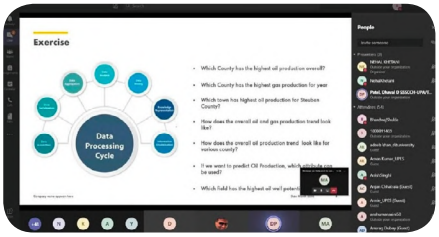
Workshop | Gas Well De-liquification Techniques: Solution to Gas Well Liquid Loading Problems

Foremost workshop was conducted for two days on "Gas Well De-liquification Techniques: Solution to Gas Well Liquid Loading Problems". by Mr Alphonse Lalnuntluanga, assistant executive engineer, ONGC. The session was started with a brief introduction about the basic production system and analysis. He introduced the participants with the ways to identify and predict liquid loading phenomenon. He covered a plethora of topics like gas well de-liquification techniques, nodal analysis, echometer software, Artificial lift mode of De-liquification, and how to install, monitor & troubleshooting. He explained all these topics in a zestful and exuberant manner while answering the doubts of the inquisitive minds.

Webinar | Data and its various aspects in Petroleum



Subsequent to the first workshop, a webinar was hosted on "Data and its various aspects in Petroleum Industry" by Mr. Dhaval Patel (Team Lead, Wells RAR and CRS at Royal Dutch Shell). He talked about What is data and information systems and what are the procedures which should be done with data so it can be significantly useful in oil & gas industry. The webinar was followed by Exercise wherein he discussed about various questions and techniques to solve them quickly with various tools of Excel.



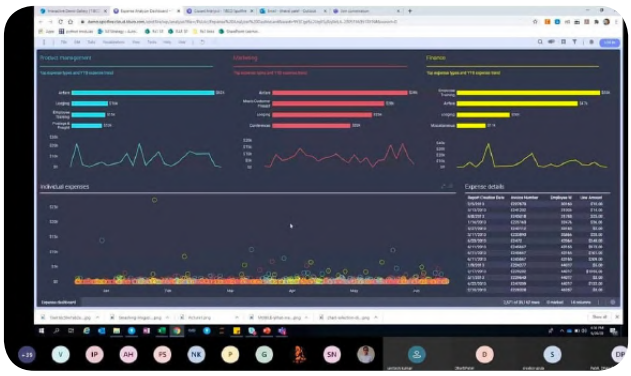
FIPI
Federation of Indian Petroleum Industry
Pandit Deendayal Petroleum University

Workshop | Reservoir Simulation using Python

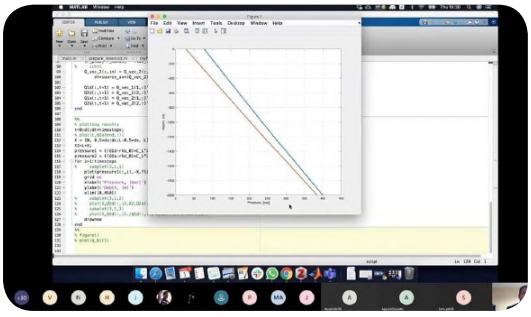
Another 3-day workshop was organized on “Reservoir Simulation using Python and Machine learning in Petroleum Industry” by Mr. Divyanshu Vyas, Founder of Petroleum from scratch and Reservoir simulation intern at Rezlytix. He talked about importance of Reservoir Simulation and Python from scratch, Visualization, NumPy in which he talked about how can we visualize the data using Python and how can we produce different graphs related to oil and gas domain using Python and its functions. Also he talked about Reservoir Simulation using Python and Machine Learning to predict different reservoir parameters.

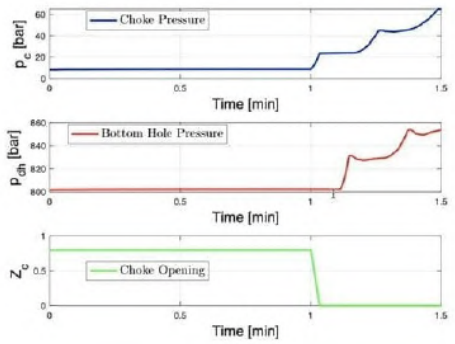
Workshop | Data Visualization Masterclass

We were enraptured about yet another 2 day workshop on “Data visualisation Masterclass” by Mr. Dhaval Patel, Team Lead, Wells RAR and CSR, Royal Dutch Shell. Throughout this workshop he covered data visualization from basics to advance level, data analysis, dashboard creation and hands on with data input, processing and visualization development. The workshop was directed with real efficiency and yet, in the space of that relatively short time, he managed to achieve a warm and genuine relationship with each student, making them feel relaxed about airing problems and helped them to arrive at possible solutions.



Webinar | Introduction to Managed Pressure Drilling: Modelling





FIPI PDPU hosted another webinar on “Introduction to Managed Pressure Drilling: Modelling” by Dr. Naveen Velmurugan, Mathematics and Control, MINES Paris Tech, France. The session was started with an introduction about the basics of Drilling. He introduced the participants that “How liquid use drilling mud to maintain a particular pressure at the boredom of the wellbore?” He elucidated on topics like Managed pressure drilling operation and how to model such systems, Industrial problems in which he briefly explained the tighter pressure control, kick detection and handling, and reservoir characterization, Derivation of Kaasa model, Comparison between lumped and distributed dynamics for industrial scenarios, Introduction to distributed models for wellbore and reservoir.

All the workshops and webinars were conducted in a dynamic manner. The enthusiasm shown by students kept the sessions thought-provoking. The workshops and webinars were appreciated by the students and they also found it to be very riveting and edifying.

Technical Articles

AI: The Next Transformation for Oil & Gas

Written by: Harsh Kothari
Edited By: Eshaan Verma

Harsh Kothari, Third Year Petroleum Engineering Undergraduate Student, Tech Investment Geek writes an article on AI: The Next Transformation for Oil & Gas.

Innovation changes the nature of energy demand

• Pre-history (e.g.): food calories + body => manual labor

• Traditional (e.g.): flowing water + wheel => milling

• Modern (e.g.): combustion + turbine => electricity

Now the Age of AI has come

Since the inception of Artificial Intelligence (AI), technology has driven the development and transformation of the oil and gas industry. Technologies to locate and extract oil and gas reserves enabled the shale revolution, and a new revolution is around the corner for oil and gas exploration and production companies. While it might sound like something from science fiction, AI and machine learning has the potential to reshape the oil and gas exploration and production landscape. Once viewed as a novelty, AI and machine learning are not far away from becoming mainstream for all exploration and production companies. The following discusses what AI and machine learning are and discusses applications for the oil and gas industry.

All problems are not created equal, which provides a unique opportunity for the oil and gas industry. Some business models have a dependency on human emotion, meaning that solving problems must consider the potential paths of emotional reactions. This is a driving factor behind why almost every energy super-major and large public exploration and production company is making significant investments in AI. Some estimate that the oil and gas investment for AI will reach $3 billion by 2022.

The potential applications for exploration and production companies seem limitless. The International Energy Agency estimates widespread use of digital technologies could increase oil and gas reserves by about 5% and reduce production costs by 10% to 20%.With advances in machine learning and AI, tools can now be used to troubleshoot underperforming wells, enhance reservoir modelling and carry out preventative maintenance before problems arise. Shale resource development is an excellent laboratory for AI and machine learning given its high intensity of repeatable activities and its much shorter investment cycle.

The applications of AI and machine learning have the ability to further drive down shale resource finding and development costs allowing shale resources to remain highly competitive in the global energy market. Making asset acquisitions can be a time consuming and challenging process. Publicly available court records, land data and production information

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THE REAL QUESTION IS, WHEN WILL WE DRAFT AN ARTIFICIAL INTELLIGENCE BILL OF RIGHTS? WHAT WILL THAT CONSIST OF? AND WHO WILL GET TO DECIDE THAT?

can now be reviewed in a manner previously not considered possible. Residential real estate companies are already utilizing AI in a similar manner to review vast amounts of court records and listing information to identify optimal acquisitions. AI will soon be utilized by energy companies to identify optimal locations by consider interactions with existing nearby wells and other factors.

In conclusion, early adopters of AI will likely develop a significant competitive advantage, and the adoption rate of new technology is exponentially faster than it was a few decades ago. Mainstream adoption of these new technologies is expected in the next three to five years. Companies will soon experience significant efficiencies that will translate into competitive advantages. It is likely time to consider how your company could begin to harness these technologies to remain competitive. Factors promoting AI USAGE:

- Energy efficiency
- Environmental legislation (CO_2, production-related issues)
- Difficulty of finding cheaply recoverable oil
- Increasing oil price lowers consumption & attracts substitution
- Technology improvements for renewables

Technology: Need of the Hour

- Shubham Patel

Shubham Patel is an undergraduate pursuing B.Tech in Petroleum Engineering at School of Petroleum Technology, Pandit Deendayal Petroleum University, currently in Sophomore Year. In this article, he has discussed newer technologies that are being adopted by various O&G companies and their impact.

The spread of COVID-19 has disrupted global financial and commodity markets. The pandemic caught oil and gas industry unprepared for completely changed landscape.

Global demand for oil and gas fell drastically and with increasing supply all the storage facilities were filled, leading to glut. Oil and gas sector has always been volatile; with global lockdown many huge oil and gas industries incurred heavy losses. Many companies adopted policies for developing sustainable long term risk management strategies to ensure business continuity. On the other hand companies are leveraging technology to create an effective environment for resources to keep operations running. Baker Hughes, Halliburton, Weatherford, Schlumberger and other service providers are leading the technological advancements in the oil and gas industry. Some of the newer technologies and their impact are discussed in this article.

Subsea wellhead removal is a required step to successfully abandon a well in many areas, but it can cost a handsome amount of money and time to perform the job. Baker Hughes worked with Wintershall DEA to cut the subsea wellhead from an abandoned exploration well in 360-metre water depth in only 35 minutes. By comparison, alternative abrasive cutting methods could take as long as five or six hours for the cut alone. The Terminator system can be deployed from a vessel and uses a mechanical cutter, rather than water jet cutting methods of conventional systems, to eliminate associated risks with high pressures. In addition, the system can reduce offshore personnel by two-thirds compared to conventional systems, requiring just two people instead of the typical six for water cutters. Advanced design reduces fuel consumption and weight compared to older systems. One of the major merits of terminator is its lower CO2 impact on the environment.

Managed Pressure Drilling (MPD) started as an essential technique for drilling wells with narrow drilling window zones. Now, it has become one of the hottest prospects in terms of efficiency and safety. Weatherford Managed Pressure Drilling (MPD) teams attained a 100,000-ft deepwater milestone in the Gulf of Mexico. Integrating planning and execution software along with advanced MPD technology, Weatherford project engineers and MPD crews reached all operator depth goals to successfully drill, log, core, case, cement, and even complete challenging intervals. MPD teams dynamically managed downhole pressures through extremely narrow pressure envelopes to safely control all influxes and losses to the formation. By facilitating formation integrity testing, Weatherford MPD technology enabled operators to map formation pressure boundaries for future wells. In addition, operators realized significantly lower well construction costs.

Baker Hughes' i-Trak drilling automation services

In today's complex drilling environment where surface and downhole real-time systems must deliver according to plan in a consistent, reliable, and safe manner, automation of drilling systems is crucial. i-Trak drilling automation services improve drilling performance, wellbore quality and trajectory; extend bit life; reduce nonproductive time to deliver wells faster and more economically; while reducing operational risk to enable de-manning at the rigsite.

Applications

- Wells with inefficient or inconsistent drilling performance
- Wells with hole cleaning issues, stability issues, or challenging pressure windows
- Wells that must be consistently and repetitively drilled according to trajectory plan

Benefits

- Consistent, predictable, safe drilling
- Integrated drilling advice through wellsite, operator, and remote support teams.

Schlumberger's ACTive: Real-time downhole coiled tubing services

ACTive Power CT real-time powered downhole measurements system delivers continuous fiber-optic data and power from surface through a hybrid cable in the tubing, eliminating the need for batteries to power downhole tools. The result is virtually unlimited downhole intervention operation time for powered tools—including logging tools—with real-time downhole data through fiber optics.

With fewer trips to surface to replace batteries, operations are more efficient. In addition, downhole tools that were previously used in some longer operations only intermittently during the job to avoid premature battery depletion can be used continuously to improve data quality and interpretation capabilities, leading to enhanced decision-taking and overall operational performance. New tools and operations can also be developed that previously were impossible because of battery limitations.

The 2020 World Oil Awards advisory board selected ACTive Power system as the winner of the Best Well Intervention Technology Award.

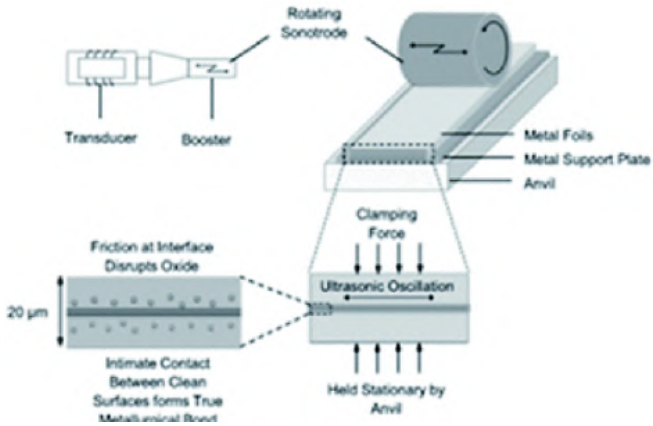
3D printing: A Game Changer in Oil and Gas Industry

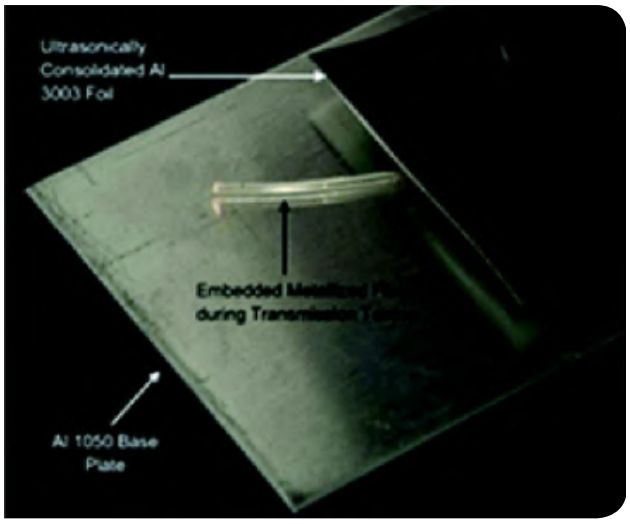
- Sanjeev Singh

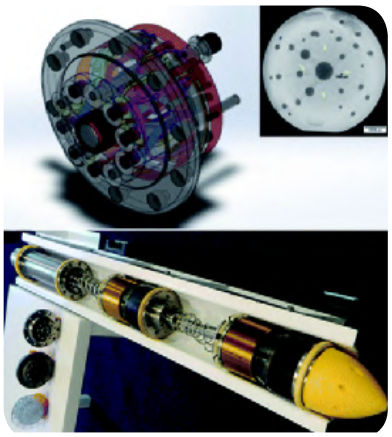
Sanjeev Singh is a final year Master's student at SPT, PDPU. He like to solve problems and learn with the advancing times. In the present article, he has talked about the opportunities revolving around 3D Printing for the Oil and Gas Industry. He hopes that the article instigates young minds to search for newer applications of this wonderful technology.

Equinor recently completed the world's first successful logistics operation with a drone to an offshore installation over a distance of 80 km. The drone transported a 3D printed diesel nozzle holder- a critical component used in the lifeboats. It was a praiseworthy achievement and would certainly revolutionize the logistics operation in the coming days. I was however intrigued by the use of a 3D printed nozzle, it was redesigned and modeled in 3D before an advanced 3D metal printer produced a replica in a sturdy, industrial alloy, Inconel 718. A part that is no longer manufactured by the parent company was quickly manufactured and efficiently delivered. This is the reason why 3D printing is having such a huge impact on the industries across the globe and gaining acceptance in the Oil and Gas industry as well. 3D printing or Additive manufacturing is a process of making 3-dimensional solid objects from a digital file. It is a way to manufacture the parts quickly and sometimes inexpensively. Metals or alloy powder is used with laser to print objects in a layer by layer fashion. Each layer is a thinly sliced horizontal cross-section of the object being constructed. Hence, a successive layer of the material unit object is created making it more flexible than regular manufacturing. In general, a metal powder, laser equipment, and a 3-dimensional model are all required to get started with additive manufacturing. There are already large 3D model repositories available online to choose from and learn. Even 3D modeling software is available which can be used to create a personalized model.

One of the key benefits of additive manufacturing is the capacity of rapid prototyping. Now the companies can speed up their product development process, product designers can visualize, develop, and validate their designs quickly and cost-efficiently. In 2016 Shell successfully created a buoy for oil and gas stations in the Gulf of Mexico. The engineers were able to produce a miniature prototype within weeks which in contrast would have required several months. Rapid prototyping thus allows the oil and gas industry to engage in multiple design cycles and quickly test design concepts. Traditionally the complex mechanical parts were broken down into simpler units and later on welded together to obtain the final geometry. But with the advent of additive manufacturing innovative shapes and complex geometries are prepared with a reduced number of parts, thereby reducing assembly time and improving performance. Additive manufacturing also optimizes asset maintenance in multiple ways. Nowadays, especially during the lockdown imposed in the majority of nations, the supply chain of the oil and gas industry is adversely affected causing significant logistics challenges. Since the timely delivery of high-quality maintenance parts and operational equipment is of utmost importance for







minimizing the downtime. AM minimizes the pressure of maintaining spare parts inventories and reduces warehouse stocks through on-demand printing. As the pursuits for new reserves takes oil and gas companies to more remote locations, the prospect of onsite manufacturing becomes even more alluring.

The Oil and Gas industry has shown slow but steady adoption of 3D printing n recent years. There are many challenges towards the widespread adoption of this technology involving lack of manufacturing infrastructure, concerns for certifications and rigorous regulatory standards, etc. However, the benefit of 3D printing far outweighs the challenges of developing a strategic approach to technology. On the whole, it would enable the oil and gas companies to streamline the operational processes and achieve significant cost-savings. As overtime newer applications are identified and the prevailing challenges are encountered, the industry is bound to open up to the benefits of 3D printing.

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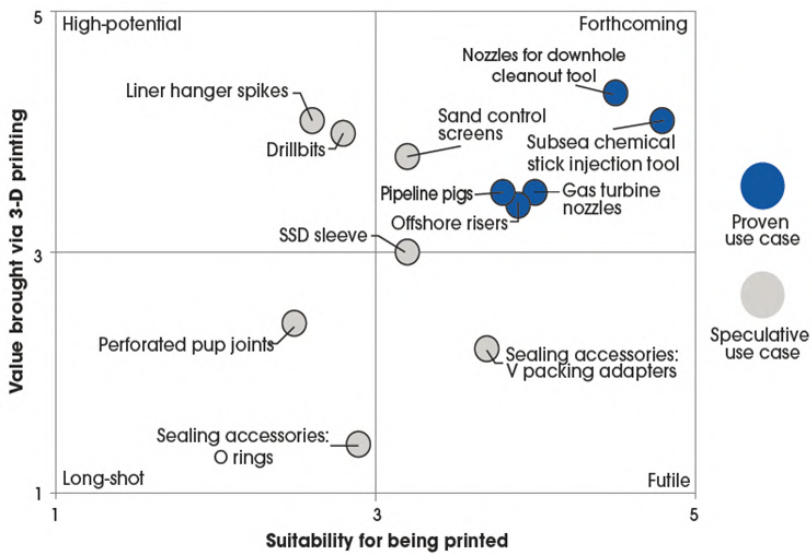
INDUSTRY LANDSCAPE, TECHNOLOGY AND QUALITY ISSUES/ APPROVALS ARE THE FACTORS THAT COULD DETERMINE THE FUTURE ADOPTION OF 3D PRINTING IN OIL AND GAS.



Artificial Intelligence: The Next Digital Frontier for Energy Revolution

Written by- Dhrumil Savalia
Edited by- Hitakshi Kubavat

Dhrumil Savalia is a final year undergraduate student of B.Tech. SPT. HIs article explores the strength of artificial intelligence towards becoming the next big digital frontier for Energy Revolution.

Artificial intelligence is one of the most reliable and emerging technologies in the world. It is made for simplifying human tasks that are considered to be time-consuming and mistake-prone. AI technology can recognize intricate patterns and perform different tasks based on those patterns. It is of three different types based on the workload it can handle and efficiency.

There are many definitions based on AI brought by the technology-driven world. It is a set of technology that identifies patterns of data and reproduces them on new information. It is a set of mathematical algorithms that enables us to have computers find intense patterns that we may not have known to have existed without us being able to hardcode them manually. It aggregates knowledge from different sources into one centralized cloud and provides them in an accessible manner. AI systems typically demonstrate behaviours associated with human intelligence, learning, reasoning, problem-solving, knowledge representation, and for data scientists, AI is a way of exploring and classifying data to meet specific goals.

Chatbots have natural language processing capability, and it is used in healthcare to question patients and run essential diagnoses like real doctors. In education, it is used for providing students with easy to learn conversational interfaces and on-demand online tutors which is the primary use of AI speech to text technology.

Computer vision is a form of AI used to provide the street vision for the car to overcome obstructions on the road. It helps automate tasks such as detecting cancerous moles in the skin, finding symptoms in X-ray, and MRI scans.

In the case of a bank, it can be used for detecting fraudulent transactions, identifying credit card fraud, and preventing financial crimes.

In the oil and gas industry, it can be used in developing petroleum exploration techniques and distinguish rock samples. AI works on the concept of cognitive computing, which enables people to create a profoundly new kind of value, finding answers and insights locked away in volumes of data. Cognitive computing mirrors some of the critical cognitive elements of human expertise systems that reason out problems as a human does. They read and can do this at massive speed & scale.

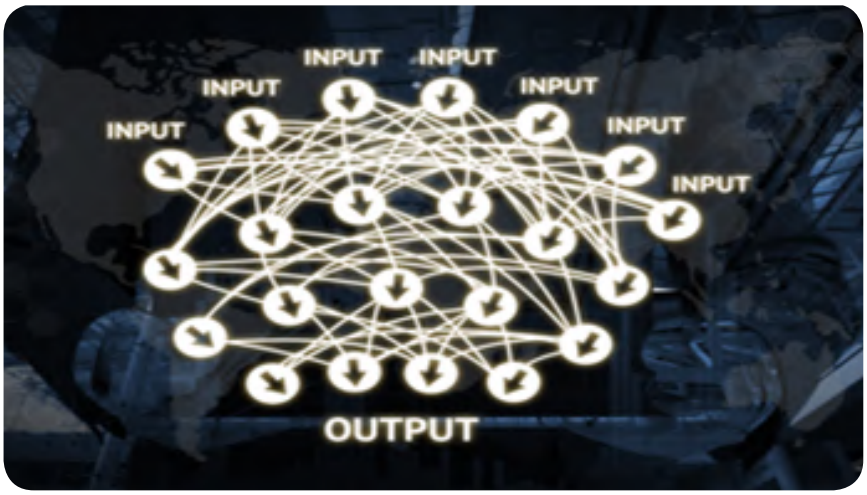
Machine learning is a subset of AI that uses computer algorithms to analyse data and make intelligent decisions based on what it has learned without being explicitly programmed. Their algorithms are trained

Autonomous Driving through AI

with large sets of data, and they learn from examples. Deep learning is a specialized subset of machine learning (ML) that uses layered neural networks to simulate human decision making. Their algorithms can label and categorize information and identify patterns.

AI is different from data science, which involves statistical analysis, data visualization, Machine Learning (ML), and more. They both can handle significantly large volumes of data. Machine learning relies on defining behavioural rules by examining and comparing large data sets to find common patterns.

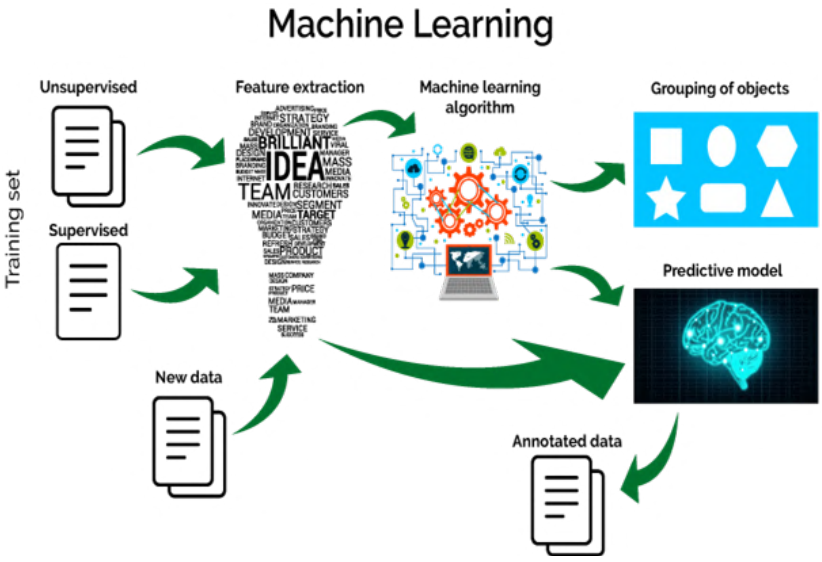
With ML, data sets are typically split into training, validation, and test sets. The training is the data used to train the algorithm. The validation subset validates results and fine-tunes the algorithm parameters. Testing data is used to evaluate how good our model is through some defined parameters such as accuracy, precision, and recall.



Configuration of layers through Deep learning

Deep learning algorithms learn from the unstructured data sets. These algorithms do not directly map the input to output; instead, they rely on several layers of processing units. Each layer passes its output to the next layer, which processes and passes it to the next.

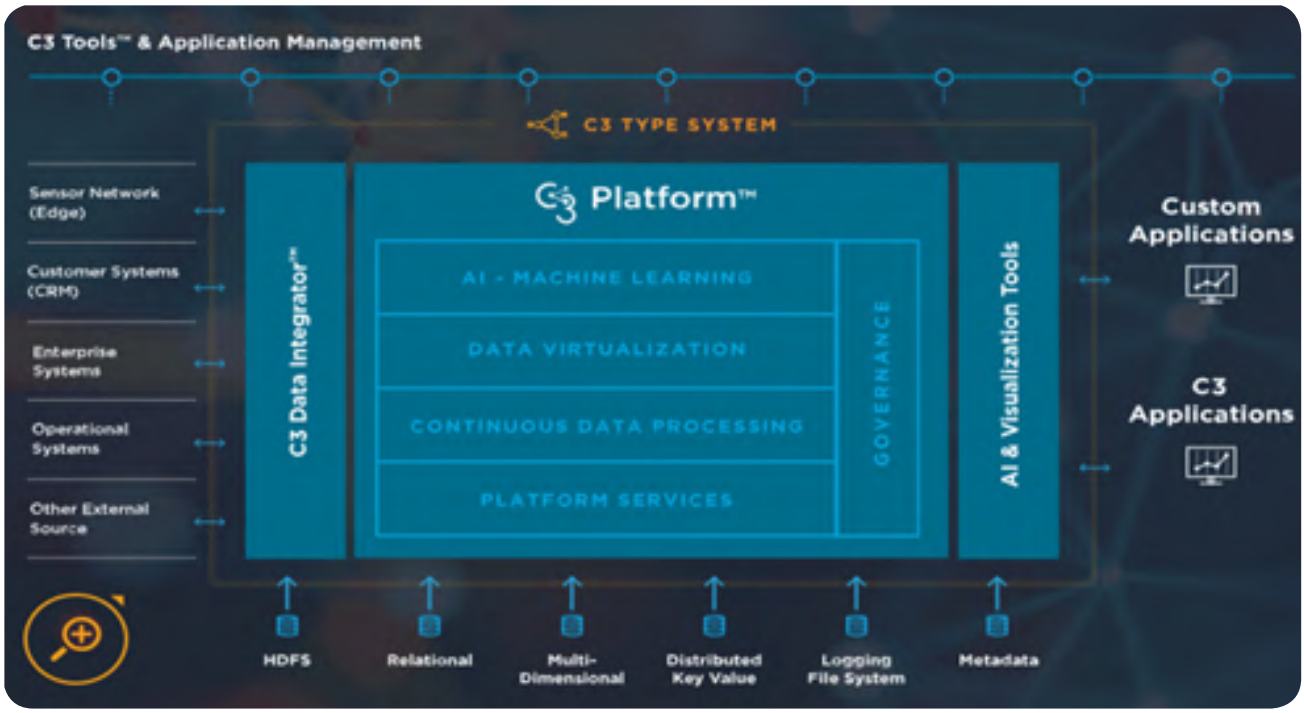
The process of developing algorithms includes configuring the number of layers and the type of functions that connect the outputs of each layer to the inputs of the next. Then the model is trained with lots of annotated examples. These algorithms improve as they are fed more data, unlike the ML algorithms, which plateau as the data sets grow. It is used in facial recognition, medical imaging, language translation, and driverless cars.



Workflow of a Machine learning project

Neural networks are a collection of small units called neurons. Theseneuronstakeincomingdata like a biological neural network and learn to make decisions over time. They learn through a process called backpropagation. Backpropagation uses a set of training data that match known inputs to desired outputs.

Perceptrons are the most straightforward and oldest type of neural networks that utilize single-layered networks consisting of input nodes connected directly to output nodes. Hidden and output nodes have a property called bias, which is a particular type of parameter that applies to a node after the inputs are considered. The activation function is run against the sum of the inputs and bias, and then the result is forwarded as an output.



Azure C3 developed by Shell- Features

Convolutional neural networks (CNN) are multi-layered networks that take inspiration from the animal visual cortex; they are useful in image processing and video recognition. Convolution is a mathematical operation where a function is applied to another function & is a mixture of two functions. They are good at detecting simple structures in an image and putting those simple features together to construct more complex features. It occurs in a series of layers, each of which conducts a convolution on the output of the previous layer.

Recurrent neural networks (RNN) perform the same task for every element of a sequence with prior outputs feeding the subsequent stage inputs in a general network.

The main area of research in AI is solving the bias problem in ML. There is a technique of directly modifying the data we feed through techniques like data augmentation to enable fewer bias data. But still, this technique of solving the bias has aroused plenty of questions in the mind of researchers since it is not an effective method of eliminating bias. AI systems experts must guard against introducing bias, whether gender, social or any other form of bias.

AI in the oil and gas industry is centred around two fields, i.e., machine learning & data science. British petroleum developed a cloud-based geosciences platform known as “Sandy” to interpret geology, geophysics, historical, and reservoir project information. The national data repository (NDR) of the UK has many terabytes of different wellbores, seismic surveys, and pipelines, which is interpreted by AI.

Spark cognition AI systems will be used in spark predict platform to monitor topside and subsea installations and analyse sensor data to identify any kind of failure before it occurs. Shell has also adopted AI software named as Azure C3 IoT (internet of things) platform for its offshore operations. It is a similar kind of platform as compared with the spark predict platform.

To develop and use AI systems responsibly, AI developers must consider the ethical issues inherent in AI. They must have a realistic view of their systems and their capabilities and be aware of different forms of bias potentially present in their systems. With this awareness, developers can avoid unintentionally creating AI systems that have negative rather than positive impacts.

To this issue, many researchers and scientists have shown their concerns by anticipating the future of AI. Professor Stephen Hawking said about the future of AI that “The rise of the powerful AI will be either be the best or worst thing to happen to humanity, we do not yet know which.” Elon Musk said that ”AI is more dangerous than nuclear weapons.” Hence Future of AI should be decided by us, whether it should be helpful for humanity or a threat.

Non-Technical Articles

Too Humane of Me

- Eshaan Verma

Eshaan Verma is a second year student of SPT, from Kolkata. He has had a keen interest in all forms of creativity since his nonage. With this article, he questions the reader in different forms, wondering: Is your mind broad enough to believe that a dead person from the past can come in the present times? Read the following article to find out.

The Creator has filled the Universe with enormous amount of something called "LIFE". Creatures have captured some Life within their bodies, which helps them grow and develop, and when the body reaches its apex capacity to grow, the creature dies and the Life is released into the Universe again.

The Creator is the supreme, HE is the mightiest. Human beings often try to be atleast at par with HIM, but they have had a long history of failing their motive. They have a tendency of observing the world, deriving inferences and constructing a strong belief system, but the mighty creator often shows even more amazing things, which makes the humans question their own belief systems. Creator is too patient to reveal HIS creation to humans completely. But whenever HE does, humans are taken by shock. They leave no tables unturned to find out an explanation to an unusual observation. In the process, if they are successful they leave no opportunity to boast, and if they fail, they assume it to be a myth. For example, virgin Maryam giving birth to Hazrat-e-Isa without any male intervention is against the conventional belief. To a greater extent, Hazrat-e-Aadam was born neither by any male nor female intervention. As these could not be explained, they are proved to be myths.

There are even bigger mysteries, which show that humans are not even at par with the Creator. Darwin's theory of evolution explained "Survival of the Fittest", could not explain the "Arrival of the Fittest". Homosexuality is a phenomenon, talked about very often, whose cause still remains unexplained.

The Creator doesn't reveal anything to everyone. Only the chosen ones get the opportunity. Often the stories of revelation by the Creator are unique. This time HE had chose me to reveal one the secrets of his creation.

I felt someone following me as I was walking through the museum glimpsing over the masterpieces kept there. I kept looking back frequently to figure out who it was but unfortunately I was unable to spot the person. After the excursion ended, I went to use the toilet. At that moment when I turned back, I spotted a bewhiskered, tall man with a gloomy appearance. Semi-clad in an animal hide, I felt he was coyly showing off his beefy physique. I didn't know why he was holding a stony tool in his hand, which seemed quite hefty. We kept glaring at each other with silence. I was petrified by his looks and my mind was storming with ideas that directed me to think ill about him. I was trying to discard all the thoughts that crossed my mind that moment by assuming him to be an actor, going to perform for a drama show, in the same premises. I broke the silence and tried to drag him into a conversation with obvious greetings but I could not comprehend what he said. This tensed me even more, so I left the washroom as fast as I could and confirmed with the staff members whether there was any drama program in the community hall of the museum, to which I heard a no.

Quite tensed, I hurried to my group. I tried to narrate the incident I witnessed to my friends, but they behaved casually and simply laughed it off. We started boarding the bus again for our departure. The sight of that strange man had

created a unique stimulus, which I was struggling to do away with. Such was his impact on me, that even while leaving the place, my eyes were looking for him. To my surprise, while sitting inside the bus, I saw that same primitive feeding on the insects and eggs of a bird. I mean how could a person eat them, all raw. No sooner did I decide to show that man to my friends, the bus started, and in no time we were outside the premises of the museum.

After the excursion, we were brought back to school. I was still not out of the shock of what I saw, but I didn't know there was more yet to shock me. I discovered some strange scribblings on the rear walls of my school. My school has a very remote location, faraway from the hustle and bustle of the city. Hardly do you see anybody near the school. As the excursion was planned that day, so no one was present in the school and yesterday I had not seen any such scribbling on the wall. Mostly abstract arts in red are made of gob after chewing tobacco wrapped in betel leaves. But this was not that art. It had some strange connection to what I recently saw. It seemed that someone had scribbled using a red brick. The painting had parallel lines, some cloud like representations, some distorted squares, some circles supported by vertical lines, a cluster of dots at some places. I kept wondering what it might be. The images of my encounter with that strange man started crossing my mind and I started having a mixed sensation of fright and excitement.

Nevertheless, I went home. I along with my family also lived in a house having a remote location. Had the reason for choosing to live in such a place been asked in a posh gathering, I would have said that we wanted to avoid the cacophony of the city life. But the obvious idea behind it was the rate of such a property is generally cheaper. There were houses around, but hardly did anyone live there. Nor there were street-lights. This silence and darkness was often disturbed by vehicles racing on the highway as fast as they could. That night, I had the last encounter with that strange man. When the light of vehicles fell on him, I could see a bunch of logs being dragged by that semi-clad man.

Very next day, I heard a huge commotion near the point I had spot that primitive for the last time. The leitmotif behind this tumult was the sudden occurence of the large bunch of logs and a peculiar stony object lying on the highway, in such a way that it disturbed the flow of traffic. Instead of removing it from the path, it became an agenda for the news-channels.But never again did I find that man. I have a strong conviction that he had come from the past, from a time hopefully when fire was discovered, and man was struggling to give wheels a nice shape.

That day, made me wonder how can a person from the past, come in the future. I was quite astonished to discover it. Even I am a human being and not the Creator, so it's quite humane of me to develop an explanation for the uncanny observation. The incident made me come up with a new theory:

Universe are infinitely many. Let each of them be assumed as a sphere of radius r, placed in the form of closed loop of total length R. Spheres overlap each other, to atleast some extent. A few points of the loop may intersect at some point. The loop may change its shape at anytime. Every sphere is filled with same amount of life. As time fleet, we are constantly traversing from one sphere to another. If we are aware of the properties of the upcoming spheres or the properties of loop we would traverse further, we can predict the future. Similarly if we analyse the previously traversed path or preceding spheres, we can know about our past. As the any number of points of the loop can co-incide at any point, incidences that might have occured in the past or would be taking place in the future, may coincide with the present. The length of the loop R and the radius of sphere r are constant, i.e., after a traverse of R length, the path will repeat. Also $r \to \infty$ and $R \to \infty$.

This hypothesis explains my meeting with the primitive man, because it gives me the liberty to assume that a few points from the previously traversed path may be joined with the present.

This explanation to support my observation may seem logical to some while illogical to others, who may in turn come up with an even better explanation. Truly, I'll be eagerly waiting for my proposed explanation to be proved a total failure, and I would be even happy if this could be done by the Creator.

Sorrow in Disguise

Dhrumil Savalia

Dhrumil Savalia is a final year student of B.Tech. SPT. He has written this poem on the sorrow that is often concealed behind fake smiles and incomplete laughter; the sorrow in disguise.

A man manifesting spunk and grit in his eyes,
Everyone explicated him as a man wise,
But no one could see a sorrow in disguise;

He strived to clinch the expedient spot,
But his nugatory endeavour failed to begot;

Moans escaped his lips through the suppressed sound of hiccups,
Which admonished him to wakeup;

He then received recurrent damp squibs as an aftershock,
But now he was as impregnable as a rock;

Resolute individual carved way for the demotivated ones,
Replicating his endurance to make them the blissful ones;

His alleviating hand seeked for amity,
But none acclaimed his charity;

The grin on his lips concealed the prejudice,
But still no one could the see the sorrow in disguise.

SPT post-graduate wins SPE 2020 South Asia Regional Student Paper Contest

Mr. Anirudh Bardhan, M.Tech (Petroleum Engineering), Batch 2018-20, Ex- Managing Editor of SPT Mirror, won in the first virtual edition of the contest, and recently presented his work in the SPE 2020 Annual Technical Conference and Exhibition. Nikhil Ranjan, in an exclusive interview with Anirudh, brings forward this extraordinary achievement.

Tell us something about the Student Paper Contest.

In an attempt to promote the students, Society of Petroleum Engineers (SPE) coordinates 14 regional student paper contests at the undergraduate, master's, and PhD levels. Students compete against other students in their region for the opportunity to advance to the International Student Paper Contest held during ATCE. Contestants enter an abstract of their paper and present it on the day of the competition. The papers of the winners who proceed to the International Student Paper Contest at ATCE is published in the conference proceedings and on OnePetro.

How did you come to know about the contest and what was your inspiration behind participating in the RSPC?

I have been following SPE international's activities since the day I joined as a Member, back in 2014. However, I was reluctant in participating in the undergraduate level. I got the inspiration to participate when I joined SPT and my senior, Mr. Adityam Dutta, won the South Asia RSPC 2019 (Master's division) with his work on petrophysical characterization of bioturbated sandstones.

Tell us about the work you presented in the contest.

The title was "Graphene as a Surfactant Carrier: A Performance study for Enhanced Oil Recovery Applications". This paper is a part of my Master's thesis, supervised by Dr. Sivakumar P, Assistant Professor, SPT. The work basically focuses on the potential of Graphene to reduce the surfactant losses due to adsorption in the subsurface during Surfactant EOR/IOR operation. The idea is somewhat analogous to drug-delivery mechanism in the medical & pharmaceutical domain.

This is the first time when SPE has shifted the entire Student Paper Contest to the virtual platform due to the ongoing pandemic. How different was it?

There were few changes. First, we were supposed to provide a pre-recorded presentation video according to their guidelines and send it to the Coordinator before the event. We were given the option to select a time slot according to our convenience and availability. The coordinator, Ms. Jackie Hoffmann, was constantly in touch with us to ensure a smooth and fair competition. On the day of the competition, the video was played first and then there was live Q&A

Usually, the winners of the Regional Student Paper Contests is awarded with a sponsored trip to the championship held at ATCE. If you win a regional contest, SPE will make hotel and flight arrangements for ATCE on your behalf. The travel allowance includes expenses for transportation, hotel accommodations, and conference registration. But, this time Chevron awarded the winners with $500, since the 2020 ATCE is entirely virtual this year.

What do you think contributed towards your winning in the entire South Asia Region?

Basically, the judges look for both innovative and applicable research work in the Oil & Gas domain. It is the same for both Regional as well as the International editions of the contest. My work was absolutely new and the judges were quite interested to know more.

How was your experience of the virtual ATCE this year?

The competition was stiff! All the works presented were excellent. The day of the award ceremony was opened by Tom Blasingame, SPE 2021 President, with his phenomenal speech of what we should expect and focus on in the near future.

Any advice for the SPC aspirants?

Do thorough literature survey for any idea you want to present. Participate with your fullest conviction and never give up. The competition is for all the levels and you shouldn't miss out such a wonderful opportunity.

Ph.D. Scholars

Ajendra Singh

Ajendra Singh is a Ph.D. research scholar at the School of Petroleum Technology, Pandit Deendayal Petroleum University since 2017. His research interest primarily lies in the area of Reservoir Characterization. He is currently working on the project 'Understanding Porosity Permeability relationship and Modeling Heterogeneity in Bioturbated Media' under the guidance of Dr. Bhawanisingh G Desai. The project primarily focuses on the efficient modelling of Heterogeneity for subsurface modelling resulting in more economic production schemes. He holds an M.Tech degree in Petroleum Engineering from RGIPT, Jais. He has 2.5 years of experience as a Project Associate at RGIPT, for conducting practical hands-on experience in Petroleum Exploration Lab, Reservoir Simulation Lab, and Well Test Analysis Lab. He won the 1st Prize for the paper "Enumerating the effect of Bioturbation induced heterogeneity on Petrophysical properties" presented at Second National conference held at Kachchh University, Bhuj from 29st Dec to 31st Dec 2018. He has numerous publications:

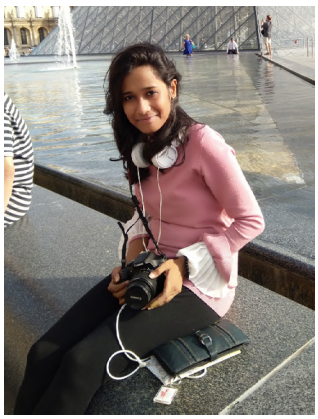
1. Assessing porosity-permeability heterogeneity in bioturbated sediments, GEOINDIA, New Delhi.
2. Characterization of Organic Potential of Jhuran Formation, Kutch Basin, GEOINDIA, New Delhi.
3. Characterization and potential analysis of Organic-rich Shale from Jhuran Formation of Kachchh Basin: Implication for Shale gas studies, PETROTECH, New Delhi.
4. Petrophysical Characterization of Jhuran Formation, Kachchh Basin, International Conference on Unconventional Energy Resources, ICUER, RGIPT, Jais.
5. Study on Kachchh Basin to Estimating the Petrophysical Properties for Jhuran Formation, India, NCUPE, IIT Guwahati.
6. Estimation of Pore Size Distribution from Thin Section Microscopy Image Data of Sandstone Samples, Kachchh Basin, India, NCUPE, IIT Guwahati.
7. Multiscale analysis of Bioturbation induced heterogeneity in Bhuj formation, Kachchh Basin.SPG, Kochi

At SPT he has experience at Petroleum Geology Lab, Geomechanics Lab, and Petroleum Engineering Lab with UG & PG students. His message to young learners: "Work hard and focus on the fundamental knowledge and don't be reluctant in asking questions because that is the only way you are going to learn

Mahetaji Mohatsim Abdulrazak

Mahetaji Mohatsim Abdulrazak is a research scholar, working under the guidance of Dr Jwngsar Brahma and Dr R K Vij. His area of interest lies in Drilling and completion, and, Petroleum Geomechanics. He has done his bachelor's degree in Mechanical Engineering from Gujrat Technical University and Master's degree in Petroleum Engineering from PDPU. Mahetaji's article titled, "Pre-drill pore pressure prediction and safe well design on the top of Tulamura anticline, Tripura, India: a comparative study" has been published in Journal of Petroleum Exploration and Production Technology on the 9th of December'2019. He has also given an oral presentation on "Pre-Drill Pore Pressure Prediction using Density and Seismic data by Integrated approach: A New Technique" at Indian Geophysical Union, Bhopal. Mahetaji has been working as a teaching assistant taking Geomechanics and Strength of Material, Petroleum Product Testing, Engineering Drawing at PDPU since September 2017. He has been working on his PhD project titled, "Wellbore Stability and Design of Safe Well In Geomechanics", since July, 2019.

Ms Archchi Sarkar



Archchi Sarkar is a research scholar, working under Dr Uttam Kumar Bhui. Her area of interest lies in Coal geology and Organic petrology. She has earned her Bachelor's degree and Master's degree in Applied Geology from University of Calcutta and National Institute of Technology (Rourkela) respectively. She joined SPT in August, 2018 for working on a PhD project whose tentative title is "Macromolecular characterization of Organic Matter rich rocks: A Multipronged approach towards clean Coal Technology". Her study focuses on the oil and gas generation and their future applicability as a chemical feedstock, characterization of coal and shale from a spectroscopic perspective and the development of a new maturity scale based on PAHs.

In September 2019, Ms Sarkar had presented a poster on "UV-visible and Fluorescence spectroscopic study of solvent extracts of coal: Macromolecular Investigation based on PAHs" at the 71st annual meeting of International Committee for Coal and organic Petrology held at The Hague, The Netherlands. In May 2019, her paper "Characterization of coal in molecular level for future use: study based on Gondwana and Tertiary coal of India" was accepted for International Conference on Electron Microscopy and Allied Analytical Techniques 2019, held at Shimla. She had attended the Second National Conference where "A Molecular Structure Approach for Evaluating Thermal Maturity during Hydrocarbon generation: a study on Jhuran Shale of Kachchh Basin, India" was discussed, and participated in a Field Workshop on " Recent Studies on the Geology of Kachchh Basin", held at the Department of Earth and Environmental Science K.S.K.V. Kachchh University, in December 2018.

Sarkar was a research fellow in a project, titled "Geological and Technological controls for underground Coal gasification", conducted under the supervision of Prof. Atul K Varma, at the Coal geology and Organic

Shivshambhu Kumar

Shivshambhu Kumar is PhD student in the Petroleum Engineering Department, at Pandit Deendayal Petroleum University. He holds M.Tech degree in Petroleum Engineering from Pandit Deendayal Petroleum University, Gandhinagar, during his master's he investigated fracture conductivity of Low and Intermediate strength proppants. He did his B.Tech in Mechanical Engineering from Dr. APJ Abdul Kalam Technical University, Lucknow. He also qualified GATE-2015 (ME) examination. His research area of interest are drilling and cementing. Currently, he is working on a project titled "Application of Nano-Particles in Cement Slurry Design for High Temperature Wells" under the guidance of Dr. Subhash Shah and Dr. Achinta Bera. Recently, he presented his research work in 3rd International Oil and Gas Chemistry, Chemicals and Additives Conference (IOGCA 2020- Virtual). He also attended National Conference on Petroleum Upstream Engineering, 2019 held at IIT Guwahati. His published journals are 1. "Design of Cement Slurry using Nano-Silica and Bentonite Clay Mixture for Oil Wells: A Review", and 2. "An Insight on Proppant Technology: Spherical vs. Non – Spherical".

Suryapratapsingh Anilsingh Bhadauria

Suryapratapsingh Anilsingh Bhadauria, a PhD scholar of SPT, PDPU. Under the guidance of our reassuring faculty mentor DR. Uttam Kumar Bhui (Associate Prof.). He has worked in the field of Carbonate reservoir (CHEMICAL EOR). His project titled as "MICRO-MOLECULAR INTERACTION STUDY OF SURFACTANTS FOR DESIGNING THE INJECTION FLUID FOR HARSH CONDITION CARBONATE RESERVOIR: APPROACH TO ENHANCED OIL RECOVERY". The grail of the project is to design the feasible injection fluid for improving the recovery of oil from high temperature, high salinity, high-pressure carbonate reservoir.

Suryapratapsingh Anilsingh Bhadauria is graduated from KITRC in Mechanical Engineering. He braced himself with PDPU in 2017 for his M.Tech in Petroleum Engineering course and continued for Ph.D. from 2019. He accomplished his M-Tech Dissertation project for 5 months in Chemical Flood Lab at the Institute of Reservoir Studies, ONGC, Ahmedabad and M-Tech summer training of 1 month in production/drilling at Ahmedabad asset, ONGC, Ahmedabad. He was also a Presenter and Attendee in 3rd International Conference of Geology and Earth Science, GEOSCIENCE-2019, April-2019 at Valencia City, Spain organized by IJEG, MADRIDGE and 32nd International Conference on INDO-CANADIAN Multi-Disciplinary Research: Trends and Prospects in December-2018 at IITRAM, Maninagar, Ahmedabad, INDIA organized by MACMILLAN EDUCATION INDIA.

In talks with our reporter he shared his experience at SPT, he shared that his journey with SPT is quite good, impressive and learn full, adding to that he shared few words to all our readers that "Study the degree course for learning the subjects, not for their results or placements". You are the Engineers so do focus on the Technical prospecting things rather than wasting your time on the Extra-Curricular Activities going on in the University."

Pragya Singh

Pragya Singh is a Ph.D. research scholar at the School of Petroleum Technology, Pandit Deendayal Petroleum University since 21st November 2019. Her research interest primarily lies in the area of Nanotechnology. She is currently working on 'Fabrication of nature-inspired Nanohybrid as Electrocatalyst for Water Splitting and Carbon Dioxide reduction'. She is being guided by Dr. Rohit Srivastava and the project primarily focuses on Waste Water Management, Graphene and Carbon Nanotube, Thin film of Nanocomposite, Electrochemical Techniques, and Synthesis of Nanomaterials. She holds a B.Tech degree in Electronics and Communication Engineering and M.Tech degree in Nanotechnology from Ahmedabad University. While pursuing M.Tech she worked with DIC - MHRD. She has also worked as a Junior Research Fellow in the DST project "Simultaneously removal of NOx and SO2 from the flue gas: A low-temperature Ozone based process. She has also published an article 'Theoretical and Experimental Application of the Mechanism of the Catalytic Oxidation Process by using Manganese based Catalyst' in Environmental Technology Review, Taylor and Francis Group.

Shubham Anilkumar Saraf

Shubham Anilkumar Saraf is a scholar of SPT. Under the guidance of our reassuring faculty mentor Dr. Achinta Bera has done magnificent work in the field of Petroleum Engineering (Enhanced Oil Recovery).

The project is titled as CO2 Capture, CO2 Flooding–EOR, CO2 Sequestration. The grail of the project is to reduce CO2 emissions by capturing it from the power plant, chemical industry and storing it into a reservoir for thousands of years, To injection of CO2 into reservoirs for improving enhance heavy oil recovery and an alternative to conventional geologic sequestration for carbon mineralization.

Shubham Anilkumar Saraf completed his Bachelor of Engineering degree in Mechanical Engineering from Gandhinagar Institute of Technology, Gujarat Technological University in June 2016. He joined Pacific Solar Technology on 15 Sep 2016. He worked as a Project Manager and decided to leave the company on 30 May 2017. Working in such a great learning environment provided him with brief knowledge about various design and modelling of Rooftop Solar Photovoltaic installing system.

During graduation, he was also awarded for participating in the one-day workshop titled “Basics of Fire & Safety and Personal Survival Techniques” organized by Institute of Fire and Safety Science, Gujarat on 22nd March 2016. He is also Certified for Faculty Development Programme on “Imaging Application through MATLAB” by the Electronics & ICT Academy at IIT Roorkee which incarnated from October 09 to 13, 2018.

He braced himself with Pandit Deendayal Petroleum University for his Master of Technology degree in Petroleum Engineering in June 2019. During his fruiting time with Pandit Deendayal Petroleum University, he published paper on “Application of Microscopy Image Analysis for Pore space and pore size distribution in Bioturbated Clastic Rock”. At Conference Name: 4th International Earth Science, Geology, Oil and Gas Conference, Kuala Lumpur, Malaysia which was organized by IJEG, Madridge Conferences.

In talks with our reporter he shared his experience at SPT, he shared that his journey with SPT is full of great learning experiences and the cherry on top is the helpful nature of Lab Assistant to do research work. Adding to that he shared few words to all our readers that” The work as a petroleum engineer provides with an excellent opportunity to pursue a career in different areas. The areas of work apart from field engineering include project management, business, supply chain, research and development”.

Avni M Goswami

Avni M Goswami is a research scholar, working under the guidance of Dr Rohit Srivastava. She is interested in the area of Drilling Fluids and additives used in Oil and Gas Industry. Having completed her Bachelor’s and Master’s degree in Chemistry from Saurashtra University, she joined European Mud Company (EMC) as a research scientist. She joined SPT in January’2020 for her PhD project titled, “Development of economically Favourable nano-additives for drilling fluid.”.

EMC is a Norway based firm which collaborates with other renowned companies and develops smart fluid additives. While working at EMC, Mrs Goswami got opportunities to work with Schlumberger, Mi-swaco and ConocoPhillips.

Anjali Choudhary

Anjali Choudhary joined SPT, PDPU in August 2019 as a Ph.d research scholar. Her research interest primarily lies in the area of Syn-Rift Deposits. She is currently working on the topic "Ichnological Evaluation of Syn-Rift deposits, Kachchh Basin, Western India" under the guidance of Dr. Bhawanisingh G Desai. Anjali recently received a SHODH scholarship with a grant of Rs 15000 pm by the Department of Education, Government of Gujarat. The scholarship aims to encourage young research scholars for qualitative research activities.

Rincy Anto

Rincy Anto is a Ph.D. research scholar at the School of Petroleum Technology, Pandit Deendayal Petroleum University, since 2017. Her research interest primarily lies in the area of Crude Characterization, EOR, and Flow Assurance. She is currently working on the project 'Chemical characterization of crude oil at the molecular level and its application '. She is being guided by Dr. Uttam K. Bhui and the project primarily focuses on Applications in EOR (Surfactant Flooding), Flow Assurance, and Demulsification. Before joining SPT she studied at Dharmsinh Desai University. She has also worked as a Junior Research Fellow at the Indian Institute of Technology, Gandhinagar.

She has presented a paper on 'Designing injection fluid during surfactant flooding: an experimental study based on optical characterization of crude oil–aqueous surfactant solution' during the International conference on Indo-Canadian Multidisciplinary Research: Trends and Prospects held at IIT-RAM (2018) and another paper on 'Optical Characteristics of Petroleum Crudes-Surfactants-Brine Solutions: Molecular Level Insights for Designing Injection Fluids for Enhanced Oil Recovery (EOR) during Conference on Macromolecular characterization of coal and hydrocarbon components for future held at PDPU (2018). She has also published a paper on "Nanoparticles as flow improver of petroleum crudes: Study on temperature-dependent steady-state and dynamic rheological behavior of crude oils" in Fuel 275 (2020): 117873.

Newly Inducted Faculties

Dr Amit Verma

Amit Verma is an Assistant Professor in the School of Petroleum Technology, Pandit Deendayal Petroleum University, Gandhinagar, India. He has completed a PhD in Petroleum Engineering from Indian Institute of Technology (Indian School of Mines) Dhanbad, India. He holds an M.Tech degree in Petroleum Engineering from Indian Institute of Technology (Indian School of Mines) Dhanbad, India and B.Tech degree in Mechanical Engineering from Uttar Pradesh Technical University, Lucknow, India. He has worked as an Assistant Manager with NCL Alltek and Seccolor Limited, Hyderabad, India, for three years. Currently, his research focuses on the development of foam fluid for hydraulic fracturing, drilling and enhanced oil recovery applications. He has published more than ten peer-reviewed research articles in a journal of repute and presented his work at various national and international conferences. He is associated with various international organization such as SPE , AGU and EAGE.

Dr Nilesh Kumar Jha

Dr. Nilesh Jha's education and training broadly comprise petroleum/reservoir engineering education, related work experience, and research after a chemical engineering undergraduate degree. He has obtained a collaborative Ph.D. degree in Petroleum Engineering from IIT Madras, India - Curtin University, Australia. His Ph. D. thesis was adjudged excellent and received the Chancellor's Commendation at Curtin for his outstanding contribution to the university's research reputation. He has several years of experience working on various aspects of oil and gas upstream with cross-domain quality teams from industry/academia. He has been working on academic and commercial projects. He has strong expertise in experimental, analytical, and theoretical petroleum/reservoir/EOR related processes. He has received numerous prestigious and high valued national/international scholarships and research/other grants on a competitive basis. He has published more than a dozen articles in high ranked journals and international conference proceedings. He is also serving as a reviewer for reputed journals. He was one of the founding members of the EAGE Curtin University chapter. He is an autodidact and cares for health, safety and environment.

Dr Paul Naveen

Paul Naveen is currently Assistant Professor at SPT, PDPU Gandhinagar. Prior to this, he has completed Ph.D in Petroleum Engineering from Indian Institute of Technology (ISM) Dhanbad (2014-20) and M.Tech in Petroleum Engineering from Indian Institute of Technology (ISM) Dhanbad (2012-14). He is associated with various international organisations: SPE, EAGE, AGU, SEG, AAPG, INTERPORE and have chaired their conference technical sessions. He has published papers in various renowned International journals and conferences. He was one among the top 3 in Geo-Quiz held in 77th EAGE Conference & Exhibition in 2015, Madrid.

Dr Mahesh Babu Jallu

Dr. Maheshbabu Jallu is Assistant Professor at SPT. He has joined SPT in the month of August,2020. Dr. Maheshbabu has completed his B.Tech in civil engineering from Jawaharlal Nehru Technological University and M Tech from IIT Hyderabad. He has completed his Phd from IIT Hyderabad & Swinburne University of Technology. He has rich industry experience from reputed firms like L&T Heavy Civil Infrastructure and Arcadis. He has several research articles , book chapters and conference papers to his account.

PDPU to hold 8th Convocation virtually

The times of pandemic have been difficult for everyone. But life must go on. In this direction, PDPU shall hold its 8th Convocation on 21st November 2020 through online mode. At this juncture we could not help but remember the past convocations.

Previous year's convocation

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