SIES GRADUATE SCHOOL OF TECHNOLOGY AND
THE PROMETHEAN TEAM
PRESENTS

SIES Graduate School of Technology
RISE WITH EDUCATION

PROMETHEAN 2020

"An Engineer's Solution"

Table of Contents

What is PROMETHEAN?

Promethean is an Annual Poster Presentation (Printed, not drawn) competition held for our new GSTian's, our First Years.

Promethean is inspired by the Greek Titan Prometheus (Ancient Greek Προμηθεύς "Fore thinker").

An innovator, problem solver and a futuristic thinker he was a champion of mankind known for his wily intelligence, who gave fire to mortals and also taught them agriculture so that they could progress and take technology to new levels.

The Promethean Team

What is PROMETHEAN?

Promethean focuses on real world problems happening in and around the world.

"An Engineer's Solution"

Promethean is a platform for our FE's to express how they would make our planet a better place by providing solutions AS AN ENGINEER.

Engineering is all about making life better, solving problems and allowing humankind to achieve new feats.
We'd like to see what plans our future engineers have! ;)

The Promethean Team

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EXAMPLES OF POSTERS

We've got examples of Posters for you.

HAVE A LOOK AND SPARK YOUR IMAGINATION!

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GIS and Remote Sensing in Water Management Studies

AFFILIATION:-
FE-IT (2018-2019)
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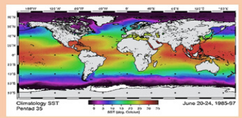
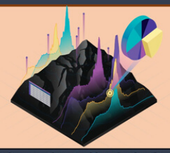
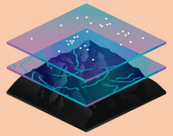
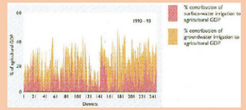




Spatial data, obtained from satellites, can be used for:
1) Preparing water accounts,
2) Prohibiting new upstream water resources development,
3) Groundwater restoration plans,
4) Developing fair irrigation management practices,
5) Providing access to water during droughts,
6) Estimating impact of retiring glaciers,
7) Reducing non-beneficial water usage,
8) Enhancing recycling of drainage water and
9) Introducing green water credits in upstream catchments, etc.





What is Remote Sensing?

Remote sensing can be defined as the science and art of acquiring information (spectral, spatial or temporal) about physical objects or areas without coming into physical contact with it.

Remote sensing uses electromagnetic spectrum to image the land, ocean and atmosphere by using electromagnetic radiation (EMR) at different wavelengths (visible, red, near-infrared, thermal infrared, microwave).
The unique spectral signatures of each object on the earth's surface can be detected at these wavelengths and can be interpreted to generate quantitative information on hydrological processes.

What is GIS?

GIS is used for spatial mapping of objects that integrates space science, survey and the mapping.

The GIS can be used to manage data as well as to integrate and analyze spatial data obtained from different sources (field surveys, remote sensing) with diverse structures, resolution and projections.

Remote Sensing and GIS Research in Water Resources Management

Poor Management of water is a big concern for water scarcity as well as unavailability of storages sites. Several other water-related issues, notably those concerned with water supply, non-point source pollution, and surface and groundwater quality impairment are still issues of great concern globally.

For example, the National Research Council (1999, 2-8) recently identified five sets of improvements that will be required to improve our management of water resources:

- Increased knowledge of the linkages among watershed components (rivers, wetlands, groundwater, uplands, etc).
- Increased understanding of the feedbacks among processes operating at different spatial and temporal scales.
- Increased availability of inexpensive, useful indicators of watershed conditions and quantitative methods to evaluate land use and watershed management practices.
- Increased availability of advanced watershed simulation models that are useful to and can be operated by managers who are not scientific experts.
- Increased understanding of the roles of risk and uncertainty in the decision-making process.

Why do we need to use this technology?

1) Satellites provide objective data for database building, which is politically neutral and cannot be manipulated.

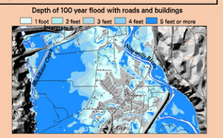
2) Satellite data describes agricultural practices, the observable landscape patterns resulting from socio-economic development, irrigation management, hydrological processes, prevailing jurisdiction and land surface features.

3) Because they are satellite observations, direct measurements are often more reliable source than secondary data. For example, a research carried out by (Bastiaanssen and Prathapar, 2000) in Gediz River Basin in Western Turkey found that satellite data estimated 60% more area than governmental statistics.

4) Many of the important hydrologic processes have local, regional, national, and global dimensions which can be easily studied with the help of satellites using remote sensing and GIS to form their accurate maps.

5) GIS have provided new opportunities to develop and run fully distributed models efficiently. These models take into account and predict the values of studied phenomena at any point within the watershed.

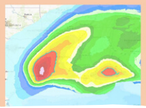
6) Moreover, it is sometimes difficult to translate research outcomes into management strategies because much of the fundamental hydrologic research is conducted at specific sites and many of the management strategies are focused on watersheds and/or administrative jurisdictions. GIS helps in communicating such data.



Future perspective

For ensuring sustainable water security, water resource management in the country need to be planned and implemented within the framework of integrated resource management, which requires consideration of a range of impacts, sometimes extending far beyond the immediate hydrological system, and over considerable time periods.

Space borne multi spectral measurements have in some cases replaced ground based observations and in others complemented at varying levels.
Improved spatial, spectral and temporal resolution data from present IRS satellites together with aerial remote sensing provides unique opportunity towards comprehensive monitoring of water resources dynamics in the country.



Current Scenario of Water management Studies with the help of GIS and Remote Sensing in India

Satellite remote sensing data for:-
1) High spatial resolution (CARTOSAT, IRS LISS IV, and IKONOS),
2) Temporal resolution (OCEANSAT, OCEAN COLOUR MONITOR (OCM), MODIS, and SEAWiFS),
3) Multispectral (IRS LISS II, III, SPOT, LANDSAT MSS, and TM) and
4) Hyper-spectral (HYPERION)
have been utilized to derive physical, geological, and ecological parameters.

1. Rainfall

Seasonal and short term (weekly) forecasts of snowmelt runoff are being provided for Sutlej and Beas and Parabati basins in Western Himalayas by the National Remote Sensing Agency since1970s.
Snow and glacier investigations and snow melt runoff forecasting are yet another area where satellite remote sensing imagery is providing information on re-treading glaciers as well as possible potential snow melt run-off.

2. Irrigation management

Programmes such as the centrally sponsored Command Area Development (CAD) scheme and National Water Management Project, manage major irrigation command projects in India (National Remote Sensing Agency,1998).

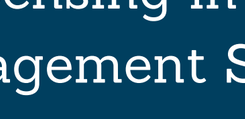
Spatial analysis of crop sowing periods and crop condition assessment have thrown up policy issues of relevance to irrigation scheduling, canal maintenance and agricultural productivity.
Multi temporal satellite data have also been used to map current status and to monitor the spatial extent of water logging and soil salinity and/ or alkalinity through the years in most of the irrigation projects. Such exercise has also helped in evaluation of the progress and effectiveness of reclamation programmes by monitoring the extent and magnitude of the problem.

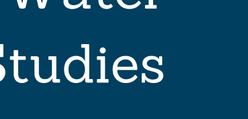
3. Reservoir capacity monitoring

A National action plan of sedimentation survey of 124 reservoirs using remote sensing technology has been taken up in India during the 10 five year plan.
The study covering around 84 M. ha and spread over 175 districts has been taken up by the Department of Space, Government of India under a national level project titled "Integrated Mission for Sustainable Development (IMSD)".
Implementation of appropriate rain water harvesting structures in selected watersheds under this programme has demonstrated the significant benefits by way of increased ground water recharge and agricultural development of once barren areas.

4. Natural calamities

Though sitcom based applications for management of water resources in the country had a modest beginning with Central Water Commission (CWC) and Snow and Avalanche Study establishment (SASE) have deployed INSAT- DRT





5. Ground water prospecting

Under National Drinking Water Technology Mission, the Dept. of Space with the active co-operation of various user departments has prepared district-wise hydro-geo-morphologial maps on 1:250,000 scale covering all 447 districts in the country using satellite imagery with limited field checks and available information.

In order to provide safe drinking water to rural masses, the Dept. of Space has taken up a project titled "Rajiv Gandhi Drinking Water Mission".

The project aims at generating groundwater prospects maps at 1:50,000 scale using IRS-1C/1D LISS-III data for entire country. Ten states, namely Rajasthan, Madhya Pradesh, Chhattisgarh, Andhra Pradesh, Karnataka, Jharkhand, Orissa, Gujrat, Himachal Pradesh and Kerala have been covered so far.

6. ISRO's Geo-portal Bhuvan: Gateway to Indian Earth Observation

ISRO's Geo-portal, Bhuvan is providing visualisation services and Earth observation data to users in public domain.

Some of the States using Bhuvan platform for specific applications are Punjab, Karnataka, Himachal Pradesh, Andhra Pradesh and North Eastern states. These are specific joint initiatives that address specific thematic applications in Forestry, Tourism, Municipal GIS, Geo-tagging and so on.

There are many more examples of public sector, private users and NGOs utilise the services of Bhuvan for a variety of purposes. One good example is ENVIS program of Ministry of Environment, Forests & Climate Change which is actively using Bhuvan services.

Designed to provide the information in spatial and non-spatial format for assisting the development activities of the local bodies in rural and urban areas, Bhuvan Panchayats provides information on various themes with high-resolution satellite images in the background.

Uttarakhand disaster in 2013, J&K floods and Hudhud Cyclone in 2014 and Nepal Earthquake in 2015 are some of the examples where Bhuvan provided unique services in terms of online disaster information update, forecasts and post-disaster scenario.

E-governance model for image and geo-spatial based techniques, Mobile smart phone applications for varieties of crowd sourcing applications – particular focus being on "Clean Ganga" Mission of MOWR. The tool "Bhuvan Ganga" is now available on public domain for people to participate in providing vital information for Clean Ganga

GIS and Remote Sensing in Water Management Studies

BY: ARFAH UPADE, VAISHNAVI MANTRI, S. ANANTHASELVI, DHARANI ARIKRISHNAN

Challenges in Water Supply in Urban Communities

BY: GAURANG DANDWATE

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Challenges in Water Supply In Urban Communities

Gaurang Dandwate
S.I.E.S Graduate School Of Technology, Nerul

Water Supply Model and Focus

The Integrated Urban Water Model (IUWM) approach is a paradigm shift for urban water management. It is not a prescriptive model but a process that invites existing cities and emerging ones to adjust their current planning and management practices, given their own priorities, in a hydrological, environmental and socio-economic context. It is based on the following key concepts:

Urban water security through a holistic approach implies managing water resources and its waste in a new integrated way, with a focus on:

- Aiming for water security through optimum use of all potential sources of.
- Aiming for a better utilization of natural systems for water and wastewater treatment
- Considering storm water/rainwater catchment systems as a potential source
- Strengthening leakage management and maintenance
- Strengthening resilience of urban water systems that are facing drought or floods.

Wastewater is a resource that can be used productively. Grey water can be reused for irrigation, urban agriculture and industrial processes, treated or untreated depending on the purpose of its use and its legislation; nutrients in wastewater can be used for energy production and fertilizer production.

Optimum infrastructure design implies the following key points: technology selection for water supply, wastewater treatment; sanitation is based on a wide range of indicators; such indicators include water quality, economic condition of households, size of population, access to advanced technologies and skilled manpower, availability of land; and this includes green infrastructure and low cost and energy efficient options, natural systems and innovative technology.

Point X Lite

Major problems faced during water supply:

1) Pollution and contamination
2) Leakage and maintenance
3) Water security

For the check of contamination of water in reservoirs: Physical, chemical, ionic, biological studies are conducted on water in dams, in about 5-6 years on average.

Also Sediment and Erosion control, and Chemical and pollution control measures are also taken while constructing or selecting reservoirs. Before water is transferred through pipelines, they may be treated with disinfectants like chlorine.

Leakage poses a great challenge for the water supply board. Loose fittings, pipe bursts are common, and we cannot simply afford to waste the already limited supply of water due to reasons that we can prevent.

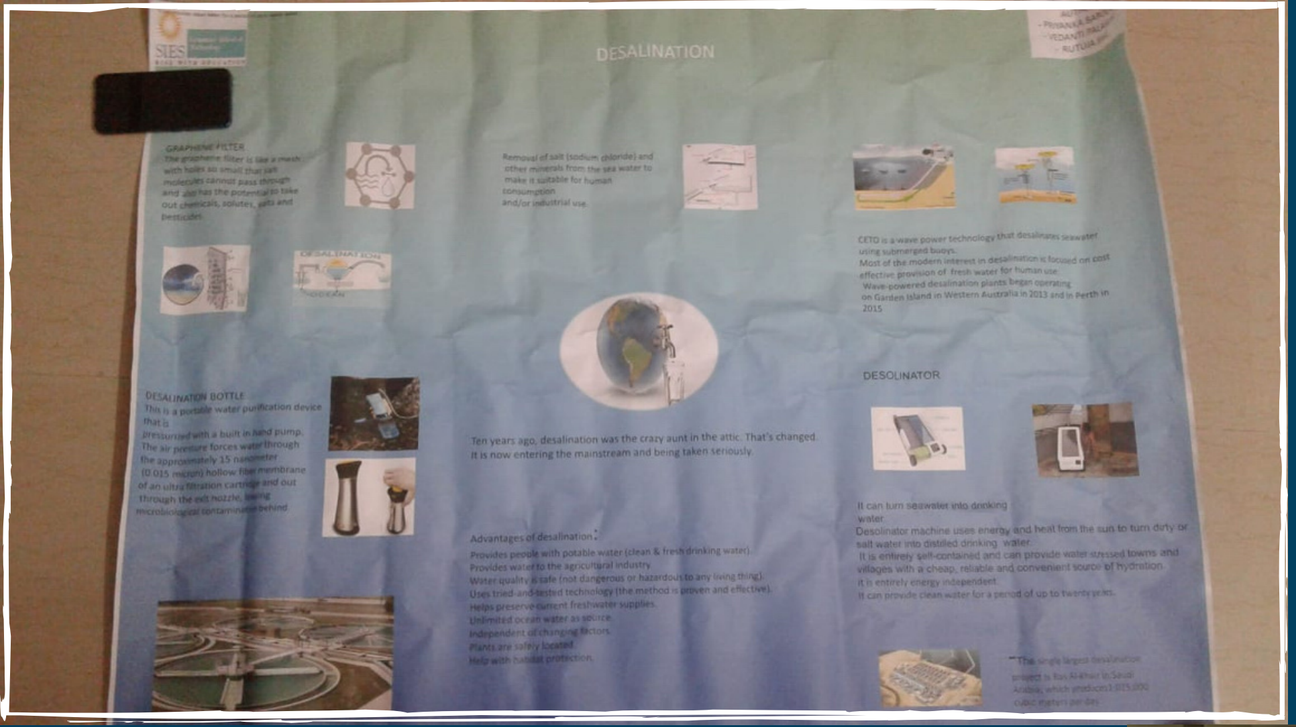
To prevent leakages, selection of pipeline material is crucial. The most used material is steel. Steel pipes are resistant to corrosion, are longer in length, easy to weld and strong.

Maintenance includes checking for leakages, loose fittings, pressure monitoring and sometimes even painting the outer surface of pipelines to prevent from corrosion and heating.

Water security is a very important concern which is often neglected. People from poor communities often install illegal side-lines to the main supply pipelines. This not only reduces output to desired destination but also increases pressure on the source as supply doesn't go as planned.

To overcome such problems, providing supply to even the smallest area, by a sophisticated planning of water supply is necessary.

Keywords: Urban water security, Grey water, Infrastructure design, energy efficiency.



DESALINATION

BY: RUTUJA FAKE,
PRIYANKA BAROULIYA,
VEDANTI PALASKAR

THE BIG DAY

THE EXPERIENCE, TRUST US, WAS LIKE NEVER BEFORE.
YOU GET TO LEARN A LOT.

Benefits Of Participating In PROMETHEAN

INCREASE OR SHOWCASE YOUR PRESENTATION SKILLS

GAIN KNOWLEDGE

LEARN TEAM AND COST MANAGEMENT

YOU'LL UNDERSTAND THE POWERS YOU HAVE AS AN ENGINEER!

GOOD EXPOSURE + GOOD EXPERIENCE

THE PARTICIPATION CERTIFICATES ARE ALL YOURS!

PRIZES AND RECOGNITION TO BE AWARDED

A CHANCE TO UNDERSTAND OUR PLANET AND HOW TO SAVE IT

The Promethean Team

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Benefits Of Participating In PROMETHEAN

INCULCATE ENGINEERING KNOWLEDGE.	DESIGN/ DEVELOPMENT OF SOLUTIONS.	UNDERSTAND MODERN TOOL USAGE.	ETHICS.
ENHANCE AND SHOWCASE YOUR PROBLEM ANALYSIS SKILLS	CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS.	THE ENGINEER AND SOCIETY.	UNDERSTAND THE ENVIRONMENT AND IT'S SUSTAINABILITY

The Promethean Team

Rounds in PROMETHEAN

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ROUND 1:
ABSTRACT POWER POINT PRESENTATION

- Teams will present an Abstract of their Solution through slides. (Power point Presentation)
- Each team can use MAXIMUM 5 slides. (Usage of more than 5 slides may result in decrease in scores by judges)

ROUND 2:
POSTER PRESENTATION

- A total of 3 teams will be selected from each Division from Round 1.
- The selected teams will present their posters to the judges in Round 2.

RESULTS

Winners will be decided on the spot. Judge's decision will be final.

The Promethean Team

REQUIREMENTS FOR EACH ROUND

Format for Round 1 and Round 2

FOLLOW THESE SIMPLE STEPS FOR YOUR SLIDES AND POSTER!

Round 1: Abstract Power Point Presentation

- Each team can use MAXIMUM 5 slides. (Usage of more than 5 may result in decrease in scores by judges)

- The MAXIMUM 5 slides may include:

1. The definition of the problem selected by you.
2. **YOUR SOLUTION** : YOUR SOLUTION CARRIES THE MOST WEIGHTAGE. TO KNOW MORE REFER TO "YOUR SOLUTION! WE WANT TECHNICAL SOLUTIONS" SLIDE.
3. Anything else you would like to include.

- TIME LIMIT : 5 MINUTES. (Exceeding 5 minutes may result in decrease in scores by judges)

Round 2 : Poster Presentation

- A total of 3 teams will be selected from each Division from Round 1.

- The selected teams will present their poster to the judges. Remember to include your college logo, affiliation and the name of the students who've made the poster. For more details, refer "Examples of Posters" slide.

- Font Size:
  Body - 28 to 35
  Heading - 38 to 45

- Chart Size :
  The Poster papers should be prepared in 36" x 48" size.

Marks Allotment

Marks will be allotted for three major features in both, Round 1 and Round 2.

1. Your slides and posters should be attractive.
2. Your Presentation skills.
3. **YOUR SOLUTION!**

Your Solution! We want Technical Solutions.

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> Engineers Turn Dreams Into Reality
> HAYAO MIYAZAKI

The SOLUTION you will provide will mark where you stand.
Promethean is all about how you, AS AN ENGINEER, would save the world.

What kind of solution do we want?

The solution you give should satisfy the following conditions:

1. You may give a solution of a technology that is already existing and define ways to make it a norm and reach the masses.
2. You may give a solution of a techonology that is under developement but once usable, what kind of impact it will make and how can we make the most out of it.

Your Solution! We want Technical Solutions.

What kind of solution do we want? (Continuation)

NOTE: The term "technology", refers to equipment/methods/activities, etc, from all branches of Engineering, i.e., Information Technology, Mechanical, Computer Science/Computers, Biotechnology, Environmental, Printing and Packaging Technology, Electronics and Telecommunication, Electrical, Mechatronics, Civil, Chemical, Aeronautical, Automotive, Biomechanical, Aerospace, Biomedical, Electronics, Industrial, Materials, Mining and Geological EngineeringPetroluem, Mangement (Engineering), Health and Safety (Engineering), Agricultural, Nuclear, Marine, etc.

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TOPICS FOR PROMETHEAN 2020

Select the one you would love to work on and blow our minds! :)

REMEMBER, FIRST COME FIRST SERVE FOR EACH DIVISION.

1) Drought Reduction technique

For example: LOW COST AI in farming, water sprays, exposure to sunlight, controlled using sensors or devices such as phone.

2) Reduction in air pollution

For example: reduction in carbon emissions by factories, Delhi smog and solutions to high cost air purifiers.

3) Modern roadways and alternatives to gas cars

For example:

a) Solar roadways, bitumen plus recycled plastic roadways.

b) Gas cars into EV- electric crate motors.

4) Flood preventions and resilience techniques

For example: self-closing flood barrier, flood control pumps, river defenses, diversion canals, etc.

5) What would you like to change: The way our rockets are propelled or the way our supersonic jets tear through the air!

6) Management of E-waste

For example :

a) Recycling policies for making our devices with recyclable material.

b) Alternative to lithium batteries and countering battery waste.

7) Reduction in effects of radioactive breakouts

For example: Study Chernobyl case for reference and come up with solutions that could reduce its effects IF HISTORY REPEATS ITSELF...

8) Restoration of water bodies

For example: Technologies that can be used to purify water bodies, deplasticization etc.

9) How to make desalination of sea water cheaper?

10) Disaster detection techniques:

We're talking about Avalanches, Floods, Cyclones, Earthqaukes, etc.
How would you warn before they occur?

11) Solutions to AVOID 'IRREVERSIBLE' Climate change.

Climate change is happening but how are you going to stop it from becoming IRREVERSIBLE?

12) Alternatives to conventional housing

For example: Reducing mortar waste, affordable and eco-friendly housing.

13) Solutions to decrease fire disasters in nature

For example: Alternatives to stubble burning (Haryana farm fires), Amazon forest fires.

14) Space waste reduction techniques.

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15) How to manage water scarcity?

Come up with unique solutions that can be actually implemented.

16) Solutions for saving marine life from oil spills.

17) How to increase the efficiency of electricity production using solar power?

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IMPORTANT DATES

22 DECEMBER 2019

- LAST DATE TO REGISTER!
- TOPIC SELECTION BEGINS (Remember first come, first serve basis for each division)

1 JANUARY 2020/ 2 JANUARY 2020

PROMETHEAN WORKSHOP

3 JANUARY 2020

ROUND 1
ABSTRACT POWER POINT PRESENTATION

18 JANUARY 2020/ 1 FEBRUARY 2020

ROUND 2
POSTER PRESENTATION

Rules and Regulations

1. All FE's must participate.

2. Participants must maintain discipline.

3. Judges decision will be final. Any argument with the judges/authority will lead to direct disqualification.

4. Organisers will not be responsible for any participant's belongings.

5. Participants must be present for the event on time.

6. All participants must carry a valid ID Card else participation won't be allowed.

Register here!

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Registration Link:

https://docs.google.com/forms/d/e/1FAIpQLSdYvTrioq8J536G56BFF4Hm1eT70xqFyo9g3nbXqXN3tT8ChA/viewform?vc=0&c=0&w=1

The Promethean Team