भारतीय प्रौद्योगिकी संस्थान दिल्ली

शिक्षा मंत्रालय (भारत सरकार) के अधीन एक स्वायत्त संस्थान

Indian Institute of Technology Delhi

An Autonomous Institute Under Ministry of Education (G.O.I.)

Hauz Khas, New Delhi - 110016, INDIA

Name : ARPIT RAJPUT

Entry No. : 2024ES10859

Program : BTECH

Department of Energy Science and Engineering

Hostel : Nilgiri

Deputy Registrar (Academics)

Student's Sign

AMD RADEON GRAPHICS

Re: Request for a winter project

From Rahul Goyal <rahulgoyal@dese.iitd.ac.in> on 06.12.2024 14:40

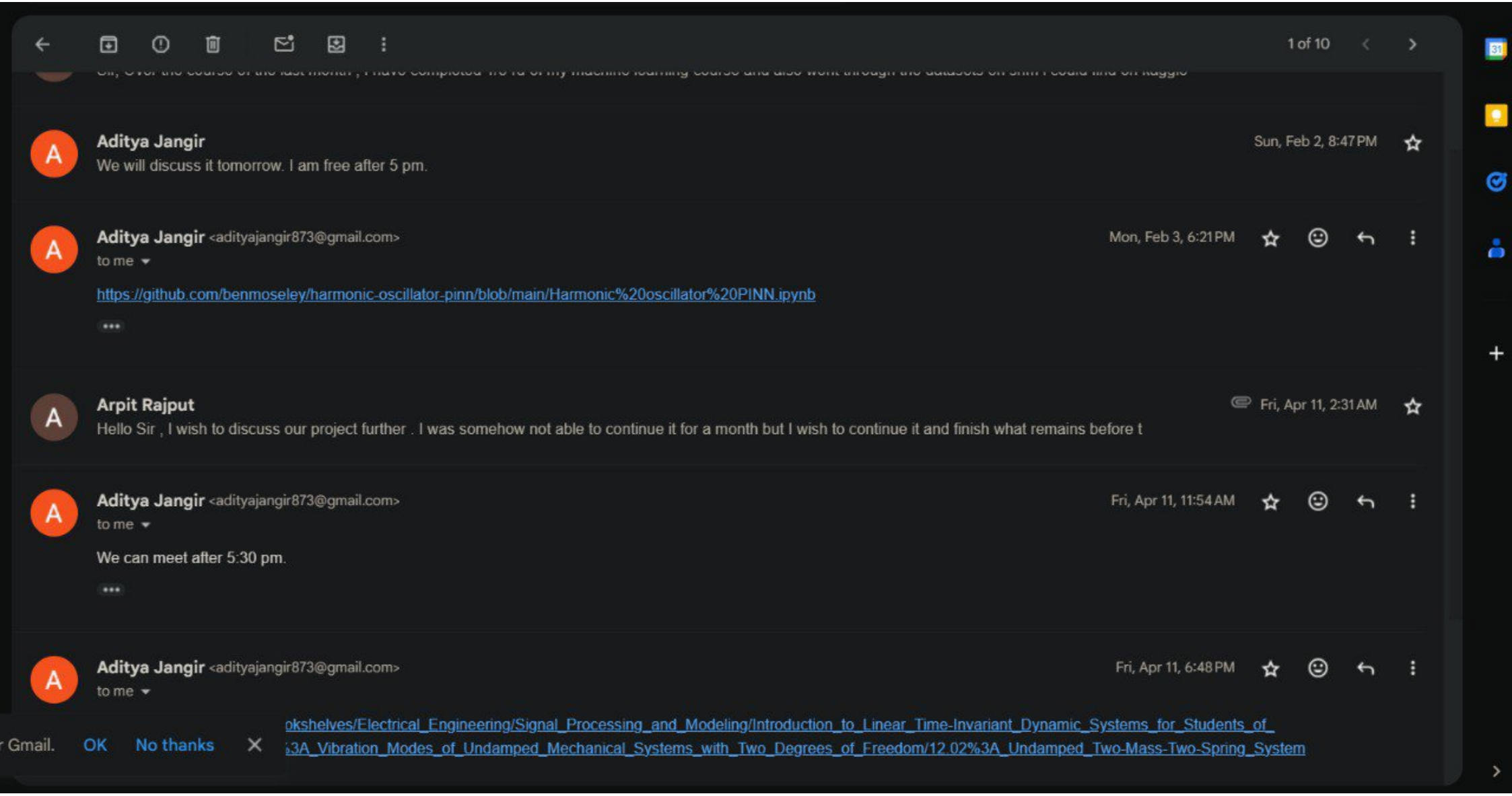
Details

Please meet me in my office to discuss.

--
Dr. Rahul Goyal (Ph.D.)
Associate Professor, Department of Energy Science and Engineering
Indian Institute of Technology Delhi, New Delhi 110016, INDIA
Member and Expert, R&D Council, NIWE under Ministry of New and Renewable Energy
Principle Member, Wind Turbines Sectional Committee (ETD-42) of the Bureau of Indian Standards
Tel: 011-2659 6246
Webpage: https://hwpliitd.wixsite.com/my-site

"Anyone who has never made a mistake
has never tried anything new"
---------Albert Einstein------------

-------- Original Message --------
Subject: Request for a winter project


1 of 10
Aditya Jangir
Sun, Feb 2, 8:47 PM
We will discuss it tomorrow. I am free after 5 pm.
Aditya Jangir <adityajangir873@gmail.com>
Mon, Feb 3, 6:21 PM
to me
https://github.com/benmoseley/harmonic-oscillator-pinn/blob/main/Harmonic%20oscillator%20PINN.ipynb
Arpit Rajput
Fri, Apr 11, 2:31 AM
Hello Sir , I wish to discuss our project further . I was somehow not able to continue it for a month but I wish to continue it and finish what remains before t
Aditya Jangir <adityajangir873@gmail.com>
Fri, Apr 11, 11:54 AM
to me
We can meet after 5:30 pm.
Aditya Jangir <adityajangir873@gmail.com>
Fri, Apr 11, 6:48 PM
to me
Gmail.
OK
No thanks
okshelves/Electrical_Engineering/Signal_Processing_and_Modeling/Introduction_to_Linear_Time-Invariant_Dynamic_Systems_for_Students_of_
3A_Vibration_Modes_of_Undamped_Mechanical_Systems_with_Two_Degrees_of_Freedom/12.02%3A_Undamped_Two-Mass-Two-Spring_System

To present the winter project

To Rahul Goyal <rahulgoyal@dese.iitd.ac.in> on 21.06.2025 21:49

Details

winter_project.ipynb (~9.3 MB)

Professor ,

I hope this mail finds you well . I am Arpit Rajput , first year btech student in Energy department . If you remember I approached you for a project during the first week of january . You allocated me one of your Phd students , Mr Aditya Jangir to assist me learn about Machine Learning through a project . Over the course of my second semester , We continued to meet in Lab after classes .I slowly became quite interested in ML to the point I have joined the AI/ML soc of IITD as executive . I'm glad to announce that the project is finally complete.

The topic that sir allocated was - "To model the trajectory of a Simple Harmonic Motion using Physics Informed Neural Networks " . When I began , I knew almost nothing about ML . I started from scratch ; right from data pre processing up until neural networks and PINNS .The project comprehensively demonstrates how using a PINN is far superior to using a simple neural network when it comes to modelling a situations in which the laws of physics are governed by a complex differential equation . The project I created is attached in the mail in ipynb format . I would love to hear your thoughts on the project and/or any suggestions or advices you might have .

Through this mail , I also convey my thanks for providing me the opportunity for a really great learning experience . I would love to find the possibility to align again over the course of my 3 years here .

Regards ,
Arpit Rajput
2024ES10859

NIRJAI TECHNOLOGIES

Date: 17th May 2025

To,
Arpit Rajput
7818033525

Subject: Internship Offer Letter

We are pleased to offer you a **Summer Internship** at **Nirjai Technologies Private Limited** for a duration of **2 months**, commencing from **20th May 2025**, at our office located at D-456, Siksha Bharti Road, Ramphal Chowk, Sector 7, Dwarka, New Delhi - 110075.

This internship is designed to provide hands-on exposure to real-world projects and professional learning. The terms and conditions of the internship are as follows:

1. Position & Department

You will be joining as an **Intern** in the **IT department**. Your daily tasks and responsibilities will be assigned and monitored by your mentor or reporting supervisor.

2. Internship Duration

The internship will run from **20th May 2025** for a fixed term of 2 months only.

3. Stipend

You will receive a stipend of **₹10,000/- per month.**

Note: This stipend includes ₹ 5,000/- as basic stipend & ₹ 5000/- as miscellaneous discretionary allowance subject to applicable tax deductions as per Indian tax regulations. The stipend will be paid monthly via bank transfer.

4. Working Hours

You are expected to adhere to the standard working hours of the organization, from **10 Am to 7:30 PM**, Monday to Friday, unless otherwise informed by your mentor or supervisor.

5. Confidentiality & Non-Disclosure Agreement (NDA)

You acknowledge and agree that all data, documents, files, source code, research, business models, software, applications, and other intellectual property that you may be exposed to, create, or contribute to during the internship, are and shall remain the sole and exclusive property of **Nirjai Technologies Private Limited**.

You shall not, during the internship or thereafter, disclose, use, reproduce, share, or exploit any proprietary or confidential information, directly or indirectly, for your own benefit or for the benefit of any third party. This includes but is not limited to using project knowledge, source code, business data, or proprietary techniques for personal use or in association with any competing business or entity.

Any violation of this clause shall constitute a material breach of this agreement and Nirjai Technologies Private Limited reserves the right to initiate appropriate legal action, including but not limited to civil and criminal proceedings, under applicable laws of India.

You will be required to sign a separate **Non-Disclosure Agreement (NDA)** at the time of joining to reinforce this obligation.

6. Code of Conduct

You are expected to always conduct yourself in a professional manner, comply with company policies, and follow the instructions and expectations set forth by the management and your reporting mentor.

7. Internship Certificate

A certificate of internship/Experience Letter will be awarded upon successful completion of the internship period, subject to satisfactory performance and adherence to all company norms.

Please sign and return a copy of this letter to confirm your acceptance of the offer and its terms. We are excited to have you on board and look forward to a mutually beneficial internship experience.

Warm regards,
For Nirjai Technologies

For NIRJAI TECHNOLOGIES PVT. LTD.
Neena
Director

Neena Jaikrishan.
CHRO

Intern's Declaration & Acceptance
I, **Arpit Rajput**, have read and understood the above terms and conditions. I hereby accept the internship offer and agree to abide by all terms, including the Confidentiality and NDA clause.

Signature: _____
Date: 19 MAY 2025

SMART INDIA HACKATHON 2024

TITLE PAGE

- **Problem Statement ID – SIH1660**
- **Problem Statement Title - Interactive Gamified approach to Ocean Literacy**
- **Theme - Smart Automation**
- **PS Category- Software**
- **Team ID- 45424**
- **Team Name - Oceanify**

OCEANIFY

IDEA TITLE

SMART INDIA HACKATHON 2024

1.

Lack of ocean literacy

How will our app address the chronic shortage of ocean related information widely present due to the way our curriculum is structured ?

- Our app makes learning fun and relatable.
- Both long form articles and trivia and short game like quiz makes the app cater to a wide audience.
- Interactive content covers key topics, helps users make informed decisions about pollution, climate change etc.

2.

Limited engagement with ocean data

How will our app prevent the misuse of ocean related data and actually help in informed decision making ?

- The app simplifies complex ocean data, presenting it in relatable, easy-to-understand formats for general audiences.
- Present data through relatable examples, case studies, or real-life scenarios helping users connect with the data.

3.

Need for scalable solutions

How will our app be scaled to a size that actually makes an impact in the community thinking and implementation?

- The app can be used in museums and science centers, reaching broader audiences in a way that traditional tools don't.
- A simple app can be carried through just a QR reaching max audience.

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User Research and Public Opinion

SMART INDIA HACKATHON 2024

1.National Museum of India

To get some real feedback, we went to the National Museum of India and asked visitors their preference between interactive kiosks and traditional written articles. Most, especially Students, favored the interactive experience.

On the other hand, some appreciated the depth of information in written articles, finding them better for learning about history and reflecting at their own pace.

2. CAS IIT Delhi

We visited the faculty members at centre for atmospheric sciences at IIT Delhi to gain expert insights from professors qualified in oceanography and climate science.

3. National Science Centre

We visited the water section of the NSC and asked people about the dangers that ocean face and ways to tackle them.

60% of the people had no idea about it. 30% people had some vague answers and 10% had some solid answers. We then asked them if they would prefer to learn all this with an interactive animated approach and most of them said they would love that.

They suggested that the app should have interactive features like slip vending machines to make the learning experience more dynamic and engaging.They also highlighted the need to simplify complex scientific concepts for a general audience so that the information is accessible to general people.

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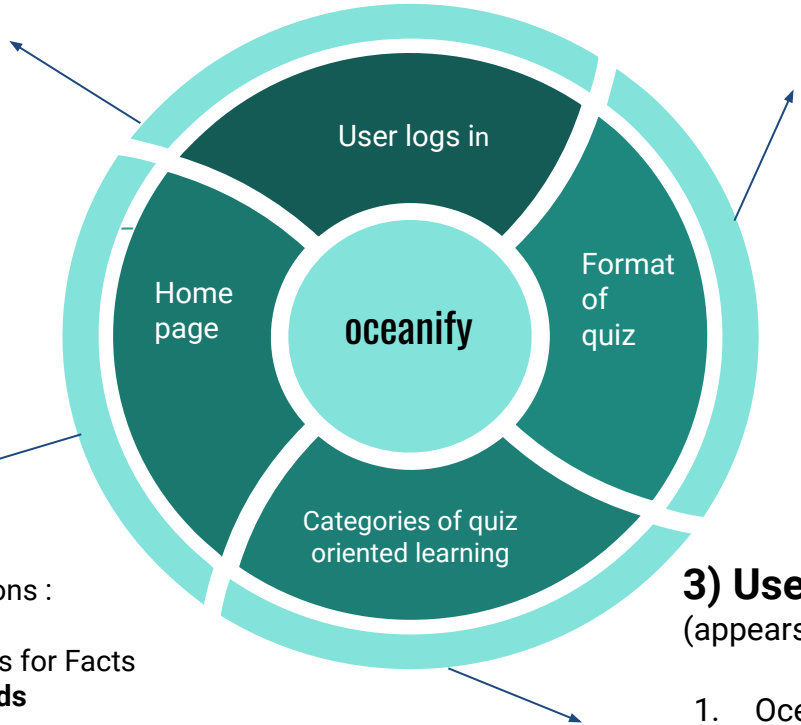
Flowchart for working of app

SMART INDIA HACKATHON 2024

1)User logs in

The mascot introduces the user to the game:

A user profile is set up.This allows the user to choose a username and helps them track their progress



4)User customized learning

10 subtopics for each category. Subtopic chosen: subtopic info, followed by quiz.

Quizzes gamified: the animated character heals for correct answers and deteriorates for wrong ones.

Slips as gift tokens are given

2) Variety of options

User chooses between 6 available options :

1. **Quiz**
2. **Trivia:** Flashcards for Facts
3. **Articles:** News and Blogs
4. **Myths and legends**
5. **Unlocked characters**
6. **Quiz history**

3) User chooses the quiz category

(appears as 5 ocean villages)

1. Ocean pollution
2. Protecting and restoring ecosystem
3. Ocean disaster
4. Impact of oceans
5. Mitigating climate change

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TECHNICAL APPROACH

SMART INDIA HACKATHON 2024

- **Frontend:**
  - HTML
  - CSS
  - JavaScript
- **Design:**
  - Figma
  - Photoshop
  - Canva
- **Framework:**
  - ReactJS
- **Database:**
  - MySQL
- **Backend:**
  - NodeJS

```
const row1Container = document.querySelector("#row1-container");
const row2Container = document.querySelector("#row2-container");
const searchBar = document.querySelector("#search-bar");

const activityArr = [
    {
        type: "row1",
        image: "images/quiz.png",
        title: "Quiz",
    },
    {
        type: "row1",
        image: "images/trivia.png",
        title: "Trivia",
    },
    {
        type: "row1",
        image: "images/articles.png",
        title: "Articles",
    },
    {
        type: "row2",
        image: "images/monsters.png",
        title: "Myths and legends",
    },
    {
        type: "row2",
        image: "images/unlocked.png",
        title: "Unlocked characters",
    },
```

```
button, input, img {
    border: none;
    outline: none;
}
/* Navbar */
nav {
    display: flex;
    justify-content: space-between;
    align-items: center;
    width: 100%;
    height: 90px;
    background-color: var(--primary-color);
}
nav .left {
    display: flex;
    align-items: center;
    margin-left: 120px;
}
nav .left img {
    width: 50px;
    margin-right: 20px;
}
nav .left h1 {
    color: var(--secondary-color);
    font-weight: 800;
    font-size: 30px;
}
nav .buttons {
    margin-right: 120px;
}
/* General styling for both nav buttons */
nav .buttons button {
    cursor: pointer;
    font-family: var(--main-font);
    padding: 7px 15px;
```

- We have started developing our web app "Oceanify" entirely from scratch.
- Custom-built user interface for easy navigation and engagement.
- Scalable backend to handle growing user numbers efficiently

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Progress

SMART INDIA HACKATHON 2024

- **The following images highlight :**
1. Our initial phase of app design and the order it'll follow.
2. The way our app will be structured.