



Oxygen | Food | Fuel

AI TREE Wants To Make A Better World.

An approach towards sustainable built environment

Backed by:

Rakuten

TDRA
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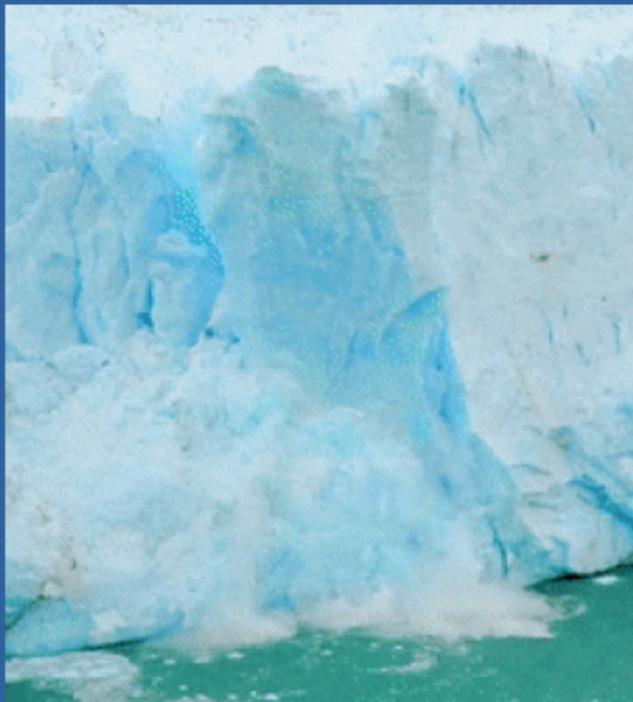
PROBLEM STATEMENT

RISING CARBON DIOXIDE LEVELS AND GLOBAL WARMING.



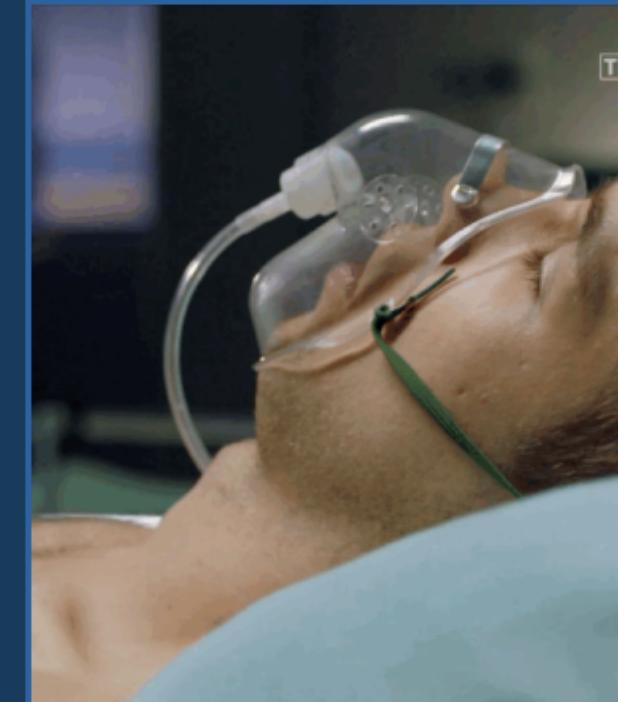
CLIMATE CHANGE/GLOBAL WARMING

It is clear that the world is in a need of large-scale action to be taken against pollution being generated on a daily basis and changing climate because of it leading to global warming,melting of glaciers and what not! :(



PANDEMIC/ OXYGEN SHORTAGE

Many people with COVID-19 have low levels of oxygen in their blood, even when they feel well. Low oxygen levels can be an early warning sign that medical care is needed.



FARMERS LOW REVENUE

Despite the potential for productivity in the agricultural sector, low productivity in agriculture contributes to the difficulty and poverty among farmers in India.



INDUSTRIAL POLLUTION- CARBON RELEASE

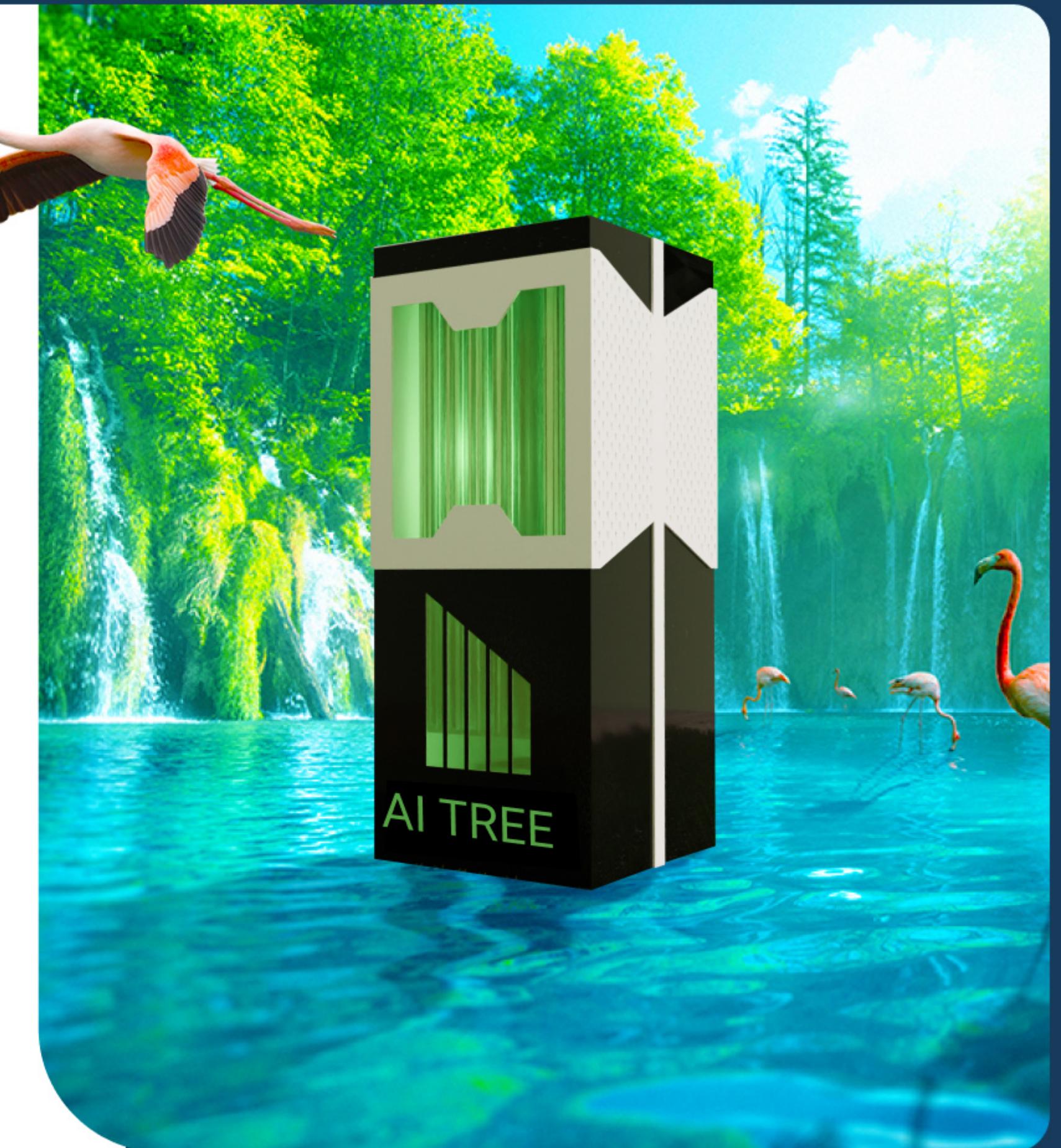
A lot pollutants- like Particulate matter (PM10 and PM2.5) ,CO , CO₂ , SO₂ being released into the air from the industries without being filtered.





THE SOLUTION

- Our Team Created the **AI TREE** , a green energy solution that captures and sequesters carbon from the atmosphere using algae. This device uses AI to optimize algae growth, carbon capture and algae output ,releases oxygen and super food, produces biofuel, creating a product that is sustainable and efficient.
- **How are WE solving the problem ?**
- **Business model:** Our initiative of this product is very **sustainable** as it would help every sections of the society,from our farmers who would grow algae doubling their profit with respect to any crop they grow, then we will be using that algae in our product AI TREE and then supply this product to the urban areas like IT sectors, offices, hospitals etc where the trees couldn't be planted or to the **red category** industries(having Pollution Index score of 60 and above),where we need carbon filtration due to pollutants directly being released and carbon tax which is been levied by the government recently.
- **NOT REPLACING TREES"-**The idea of the AI Tree Is not to Replace real trees , but complement them in area where Planting a forest would not be viable.
- **Frameworks/Tools/Technologies – AI (Artificial Intelligence)**
- **Extent of Scalability/Usability-1 AI TREE = 400 REAL TREES ("AI TREE"** is capable of producing oxygen via algae ,which is equivalent to 400 real trees)





Why is it a right Solution?

400 X EFFECTIVE

- Super-boosted algae is 400 times more effective at capturing carbon than trees in the same unit area.
- Algae-based biomaterials have the potential to bring about a seismic shift in the way we think about our supply chains. As algae grows, it absorbs CO₂ and light and creates biomass. This versatile material can have many uses, including carbon negative or neutral foods, fuels, fertilizers, pharmaceuticals, textiles, as well many more uses we have yet to discover. **ALGAE-FERTILIZER ✓**
✗ HABER-BOSCH PROCESS produces over 450 million metric tons of CO₂/yr
- By using machine intelligence to constantly monitor and manage air flow, amount and type of light, available CO₂, temperature, pH, biodensity, and harvest cycles, we maintain perfect conditions for maximum carbon sequestration

MAX CARBON CAPTURE

- The AI TREE (Bioreactor) measures -1-Meter-by-1-Meter-by-2-Meter and is designed to fit in industrial areas, including offices and homes.
SUSTAINABLE 3D PRINTING ✓ capable of producing a wide variety of polymers with the properties required for 3D printing
- Thankfully, Spirulina is great for the keto diet because it is an all-natural, plant-based way to get essential nutrients that can often be forgotten. In just 1 tsp, Californian Spirulina can provide: magnesium, calcium, vitamin A (Beta-carotene), manganese, gamma linolenic acid, chlorophyll, and more.

KETO DIET



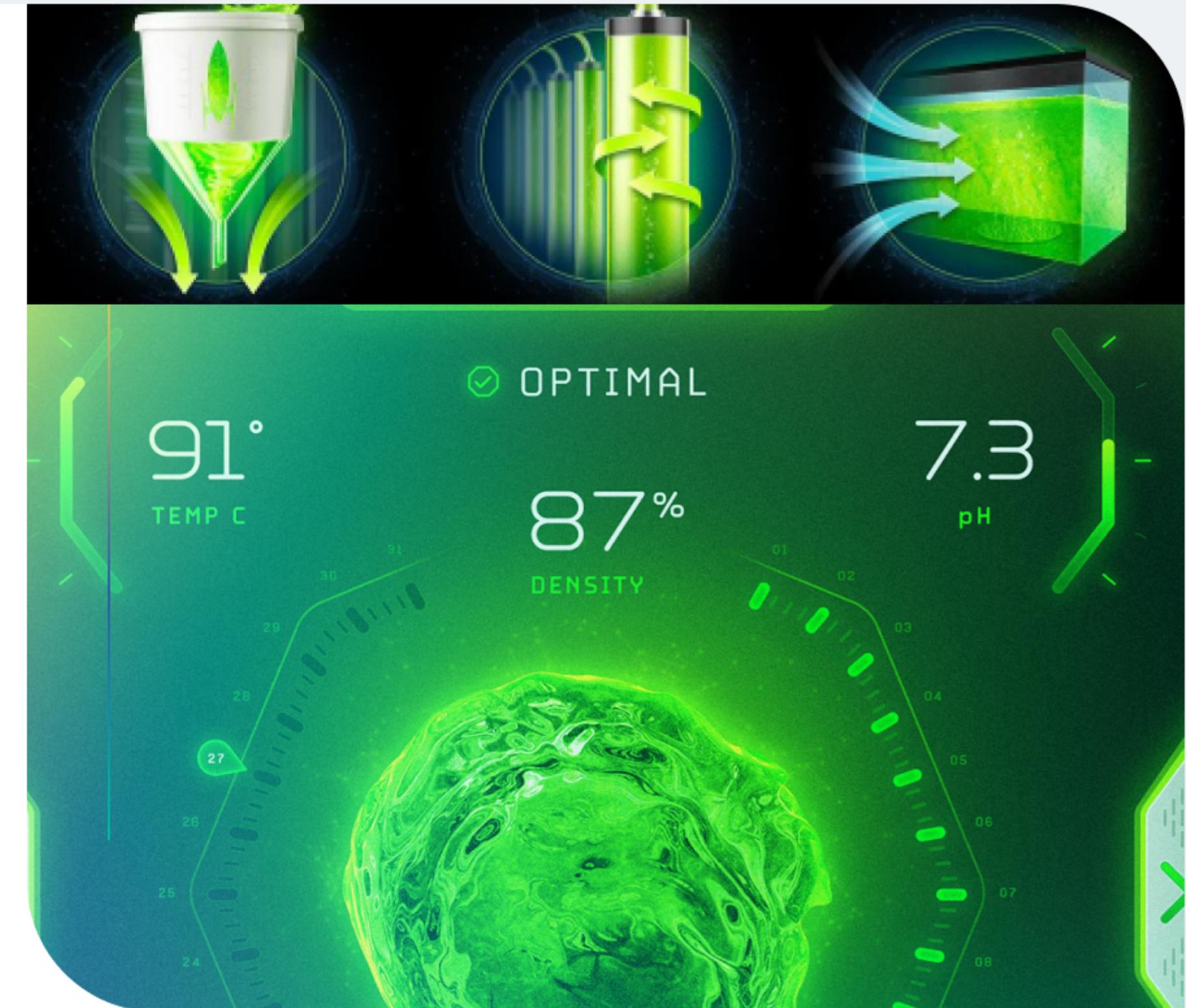


METHODOLOGY- How It Works !

- Algae need three key elements to grow: carbon dioxide, light and water.
- Algae have the best efficiency and capture capacity when receiving a steady stream of CO₂, particularly via industrial heating, ventilation, and air conditioning etc.
- As algae consume CO₂, they produce biomass. This biomass can then be harvested and processed to create fuel, oils, nutrient-rich high-protein food sources, fertilizers, plastics, cosmetics, and more.
- The device is based on a closed-system model, with every part of the growth process being tightly controlled and optimised with machine intelligence to maximise the CO₂ consumption.

- **Few notable PRODUCT FEATURES:**

- Custom CV enabled automated microscope to measure cell health
- Larger tube diameter for more efficient algae growth
- Solar power
- Conveyor pump system eases strain on algae Full growth and maintenance web dashboard interface
- Data API for centralized retrieval of AI TREE data





APP - UI ATTACHMENTS AND SENSORS USED

Arduino

NODEMCU - ESP8266

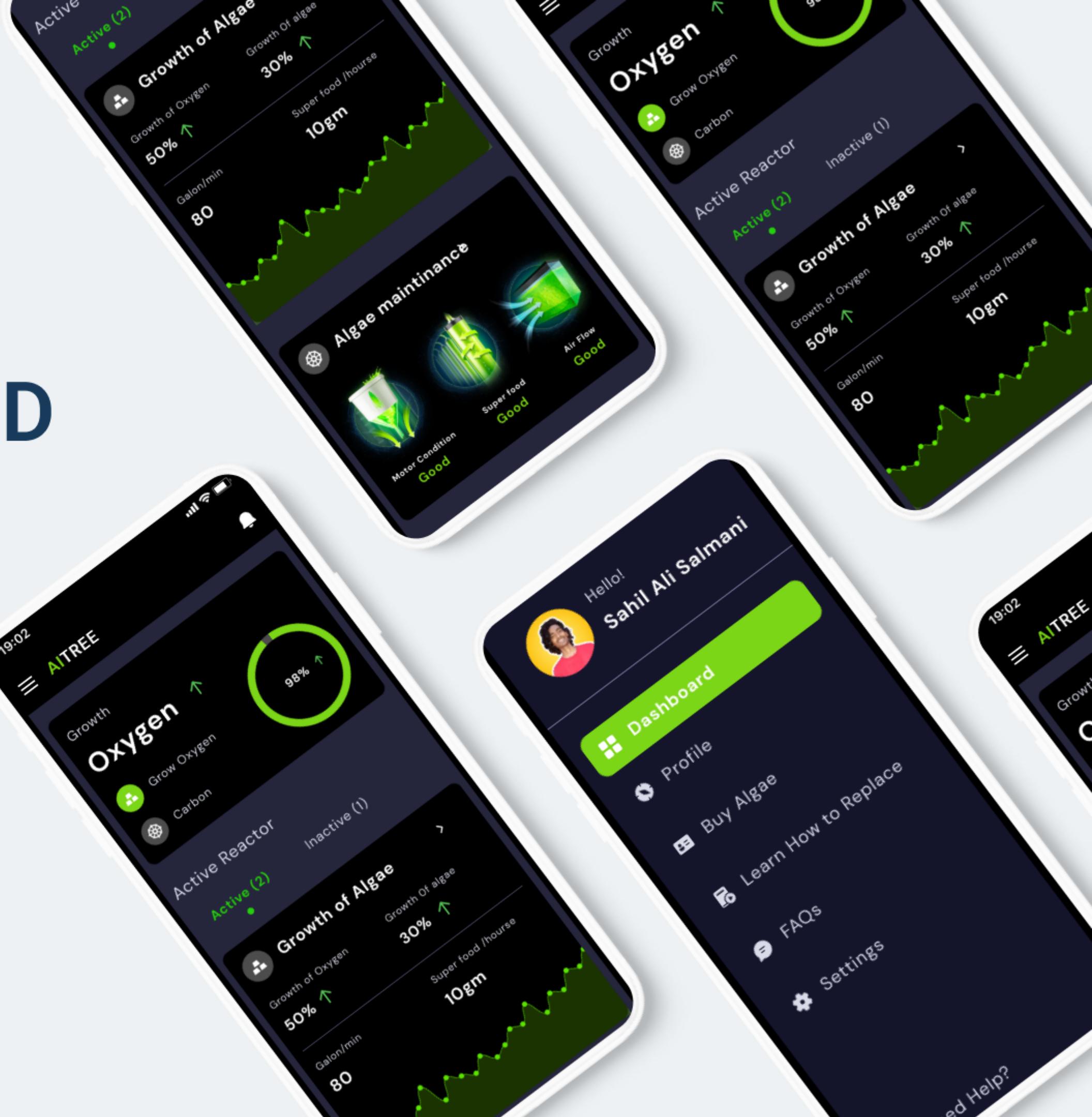
Water Temperature sensor : DS18B20

Humidity sensor : DHT11

Water Level Sensor

Lighting sensor

CO2 sensor





OUR WORKING PROTOTYPE

CONCLUSION

- There are some facts to prove why only algae AND AI TREE and
WHATS THE DIFFERENCE BETWEEN AI TREE AND REAL TREES?



RAINFORESTS **28%**

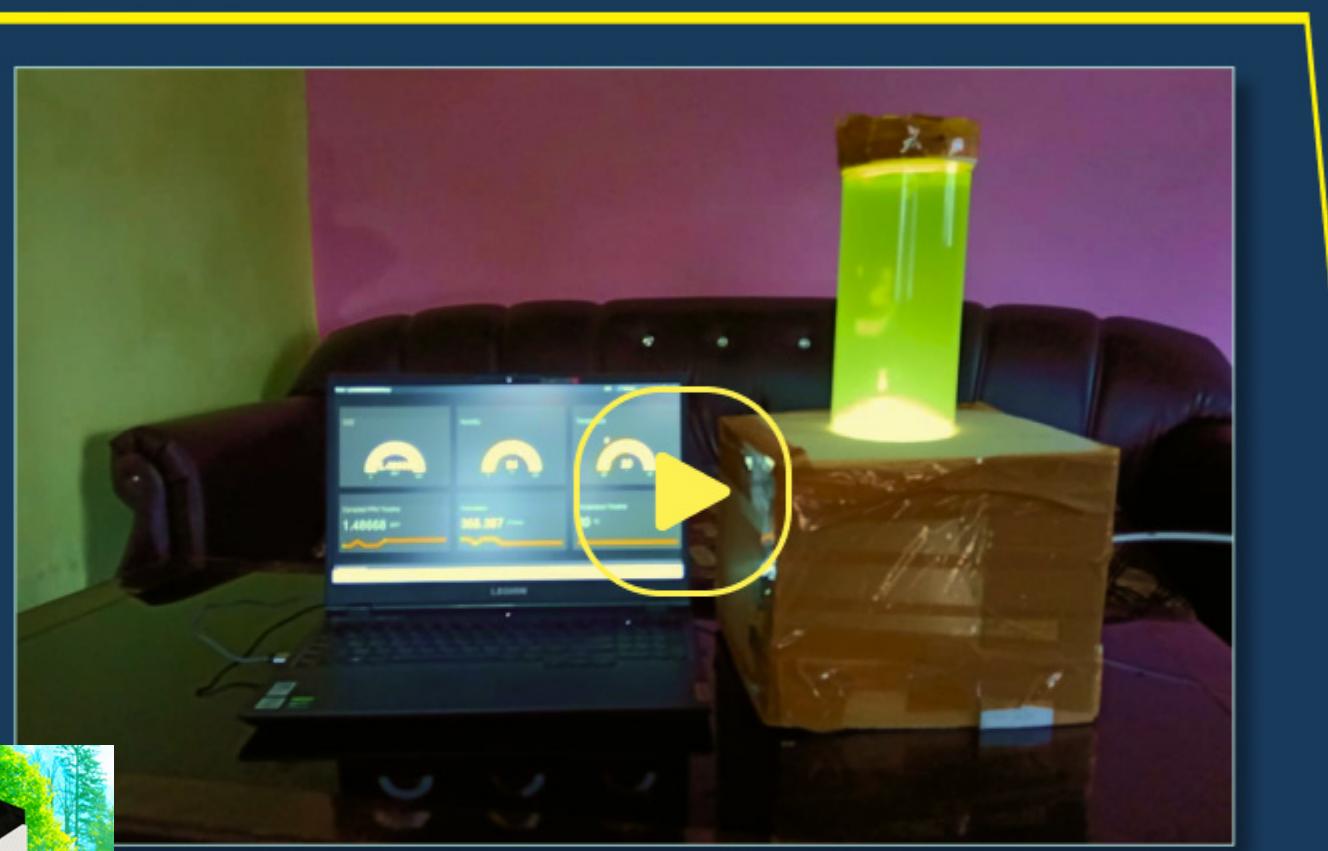


MARINE PLANTS **70%**



EXTREME OXYGEN SHORTAGE

- So in the near future we would have an extreme oxygen shortage and in order to cater daily oxygen requirement by humans the it would be very necessary as AI TREE is equivalent to 400 real trees.



VIDEO LINK

400 X O₂

SOCIETAL IMPACT / NOVELTY

- Our product is sustainable at every stage - from growing algae- engaging 50+ farmers and increasing their profit,since algae(chlorella vulgaris) is a Marine plant contributing to about 70% of the oxygen on earth , to developing ai tree - meeting with 28% of the oxygen(which was earlier from trees), removing pollutants from the atmosphere by providing the industrial unit to industries and then developing smart homes in which all the electricity supply comes from biofuel , our by product - spirulina.

PRESS RELEASE FOR AI TREE

अब घर में एआइ ट्री से बना सकेंगे आक्सीजन

जागरण विशेष 

राकेश मिश्र • लखीवारू

प्रदूषण और कोरोना महामारी के बीच सांसों के लिए शुद्ध हवा वाली आक्सीजन की पूर्ति के नये तरीके खोज जा रहे हैं। सरकार आक्सीजन प्लॉट लगवा रही है और कंपनियों आक्सीजन केंसट्रॉटर बनाकर लोगों को सुविधा दे रही हैं। अब भारतीय प्रौद्योगिकी संस्थान (आईआइटी), बीएचयू के एक छात्र ने प्रकृति और तकनीक के समावेश से ऐसा उपकरण बनाया है जो घर व दफ्तर में आसानी से आक्सीजन की उपलब्धता सुनिश्चित करगा।



अब बड़े माडल पर कर रहे हैं काम साहिल का कहना है कि उपकरण बनाने का उद्देश्य बढ़ावे प्रदूषण में शुद्ध आक्सीजन उत्पाद्य कराना है। उन्होंने बताया कि इसके पेटेट की प्रक्रिया आरंभ कर चैहे हैं और अब फैटेटी के लिए उपकरण के बड़े माडल पर काम कर रहे हैं। साहिल भली सलमानी है। साहिल सफलता का श्रेय आईआइटी बीएचयू के शिक्षक विशेषक तुमार सिंह को देते हैं। विशेषक ने भली साहिल के आविष्कार को सराहा और कहा कि ऐसे नवोन्मेष युवाओं के लिए प्रेरणादायक हैं।

« आईआइटी बीएचयू पे छात्र साहिल भली सलमानी द्वारा बनाया गया एआइटी » जागरण

बड़े मंचों पर सराहा गया है। अब वह इसे बड़े स्तर पर तैयार कर रहे हैं ताकि इसका उपयोग फैटेटी व अन्य स्थानों पर किया जा सके।

साहिल का बनाया एआइ ट्री हवा, पानी और सूर्य के प्रकाश से चलता है। प्रतिदिन इससे 128 किलोग्राम आक्सीजन उत्पन्न होती है। यह

उपकरण आकार में काफी छोटा है, जिसे आसानी से घर और कार्यालय में रखा जा सकता है। इसे तैयार करने में सलमानों के साथी अमन सिंह और आईआइटी बीएचयू के इनवेबेशन सेंटर का भी योगदान रहा है। वह उपकरण बायुमंडल से काबिन डाइ आक्साइड को खांचता है और

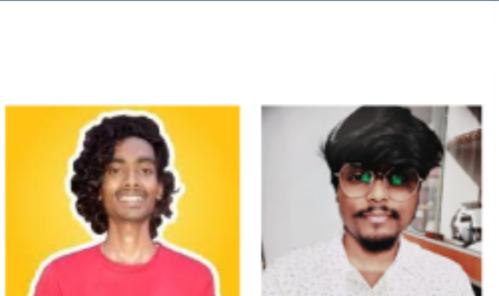
आक्सीजन में बढ़ाता है। साहिल के पिता किसान हैं। वे भाई और तीन बहनों में साहिल सबसे बड़े हैं।

इस खाते की विस्तार से पढ़ने के लिए रीफर करें



लखीमपुर: कोरोना महामारी और प्रदूषण के बीच आक्सीजन की जरूरत की पूर्ति के नए तरीके खोजे जा रहे हैं। सरकारें आक्सीजन प्लॉट लगवा रही हैं। आईआइटी बीएचयू का छात्र घर पर ही एआइ के जरिए आक्सीजन बनाने में सफल रहा है।

पेज-11



Runs by wind, water and sunlight : The AI tree made by Sahil runs on air, water and sunlight. It produces 128 kg of oxygen per day. This device is quite small in size which can be easily kept at home and office. Salmani's partner Aman Singh and IIT-BHU's Incubation Center have contributed in its preparation. This device removes carbon dioxide from the atmosphere and converts it into oxygen. The whole world is in crisis due to increasing carbon in the atmosphere, to deal with which this tool will prove to be effective. Sahil Ali

≡  **जागरण** E-paper  

fresh National Special Election 2

POWERED BY
Hindi News Uttar Pradesh Lucknow

Now oxygen can be made from AI tree in home-office, IIT BHU student made equipment

हिंदी न्यूज़ / उत्तर प्रदेश / लखनऊ

अब घर-ऑफिस में एआइ ट्री से बना सकेंगे आक्सीजन, आईआइटी बीएचयू के छात्र ने बनाया उपकरण

आईफिटियल इंटेलीजेंस ट्री यानी एआइ ट्री नामक यह आविष्कार नवप्रवर्तक साहिल अली सलमानी ने तैयार किया है। उत्तर प्रदेश में खीटी के पूलबेहड़ छालक के ग्राम ढखवा निवासी साहिल के बनाए उपकरण को तकनीक के बड़े मंचों पर सराहा गया है।

ANURAG GUPTA

Tue, 18 Jan 2022 07:09 AM (IST)



COMPETITIVE ADVANTAGE



No such product available in India Till now will the intended use cases as ours.

Creative

We may offer products or services that are unique or new to the market.

Innovative

Offer the cost of producing a product or providing services at a lower price.

Effective

Offers a market advantage that is more focused according to market needs than a more general market.

Efficient

Relationships are a gift because they greatly influence the exposure of our products and services.

Market Driven

The availability of resources is an absolute competitive advantage that we have due to tie up with various farmers

Agile

Brand loyalty can be used as an advantage of our products / services. Brand image, positioning and marketing strategy can make customers loyal to a brand.

MARKET SIZE



\$ 16.2 Billion

Total Available Market (TAM)

Market Overview

The global air purifier market was valued at USD 16.2 billion in 2020, and it is expected to reach USD 30 billion by 2027, registering a CAGR of more than 12% during the forecast period of 2022-2027.

\$ 12.4 Billion

Serviceable Available Market (SAM)

The global ketogenic diet market size was valued at USD 9.57 billion in 2019 and is expected to expand at a compound annual growth rate (CAGR) of 5.5% from 2020 to 2027

\$ 56 Million

Serviceable Obtainable Market (SOM)

The SOM is a smaller fraction of the SAM that is the target of a serviceable and realistically achievable market in the short to medium term.

<https://www.grandviewresearch.com/industry-analysis/ketogenic-diet-market>

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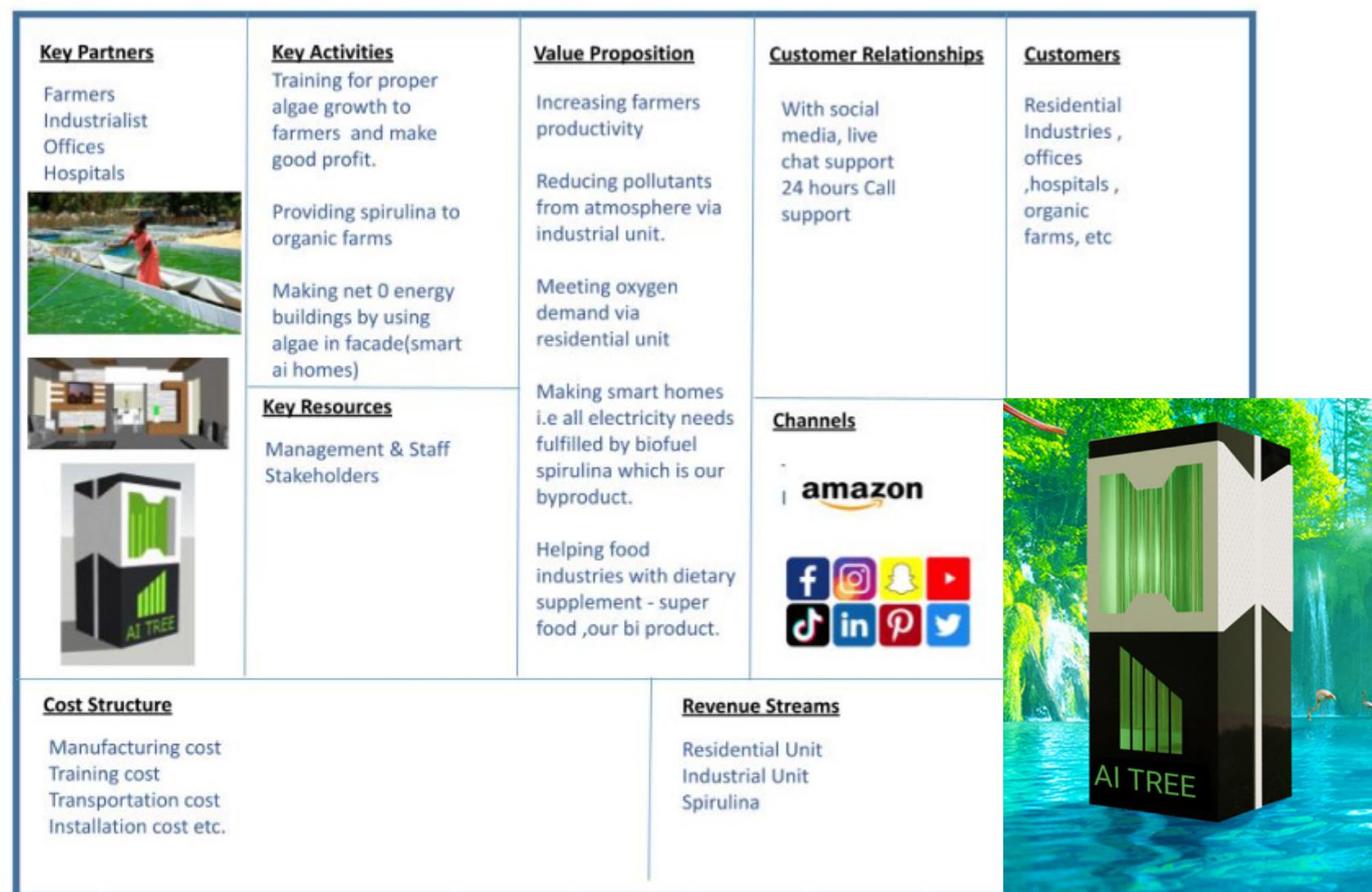
Milestones and Timeline

| Duration | Milestones | Action Points | Required Funds (inclusive of grant & owners contribution) |
|--------------------------|---|--|--|
| 1 st 6 months | <ul style="list-style-type: none"> Will Start Algae cultivation on larger scale which is a primary requirement for our project. We have a target of selling 500+ residential units after the mvp phase is tested and well tried. | <ul style="list-style-type: none"> Will Collaborate with 50+ farmers and help them understand the utilities of growing algae and increasing their profit. Will Collaborate with space designers architectural firm(similar firms- 10+) for selling our product to the residences designed by them. | 25 lac |
| Next 6 months | <ul style="list-style-type: none"> We have a target of selling 50+ industrial unit model for the core industries in which the pollutants were directly released into the air from the chimneys without being filtered. Will work on directly introducing algae tubes into facades, walls after we reach our target customers. | <ul style="list-style-type: none"> Will work upon AI optimisation, website and app so that we can start our B2B model as soon as possible and increase our contacts via various channels to reach the core industry sector. Will Reduce green algae decay rate by optimising pH,explaining good farming methods to 50+ farmers ,to increase the oxygen efficiency rate by 10% from the previous figures. | 15 lac |

Growth Projection

| Duration | Year 1 | Year 2 | Year 3 |
|----------------------|-----------|-------------|-------------|
| Per Unit Price(INR) | | | |
| (a)Residential | 8,000/- | 8,000/- | 10,000/- |
| (b)Industrial | 25,000/- | 25,000/- | 30,000/- |
| Projected Sale | | | |
| (a)Residential units | 500 | 2000 | 5000 |
| (b)Industrial units | 50 | 100 | 200 |
| Projected Revenue | 52,50,000 | 1,85,00,000 | 5,60,00,000 |
| Projected Expenses | 40,00,000 | 1,30,00,000 | 3,40,00,000 |
| Profit/Loss | 12,50,000 | 55,00,000 | 2,20,00,000 |

Business Model Canvas:



₹2,50,000 
Industrial Chimney Dust Collector

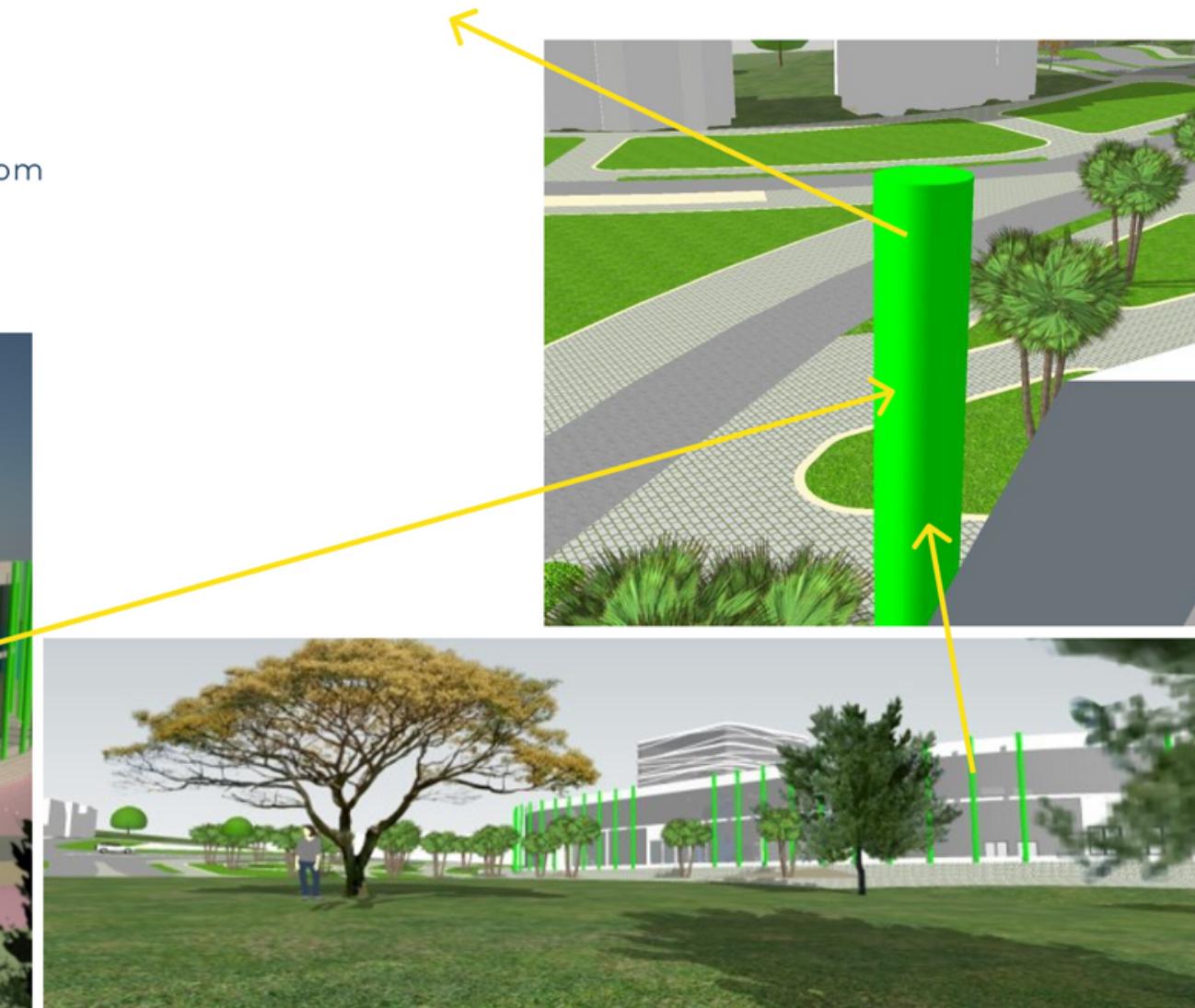
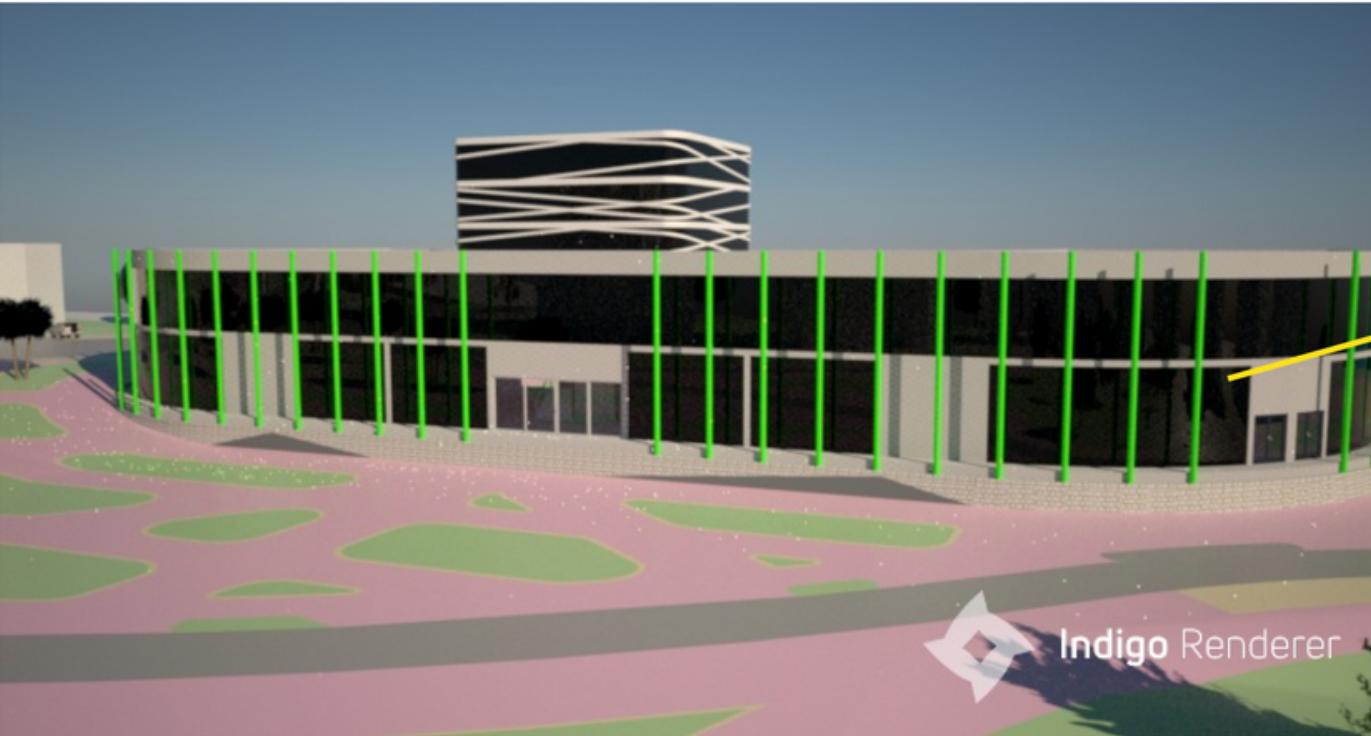
₹25,000 
AI TREE Industrial Unit



NET ZERO ENERGY BUILDINGS

FUTURE PROSPECTS- APPLICATION OF AI TREE IN MAKING SUSTAINABLE BUILDINGS

- Taking our product "AI tree" to a broader perspective ,We are trying to develop sustainable homes or **NET ZERO ENERGY BUILDINGS** meaning the total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site itself like:
- **Electricity production through bio fuel**
- **Fresh clean air**
- **Spirulina production** -a popular dietary supplement and ingredient made from blue green algae , like it's basically a by-product formed as a result of photosynthesis , which is incredibly healthy



CARBON TRANSFORMATION-

For the Essential carbon products, we can extract the carbon directly from the co2. Right now we get this carbon from the fossil fuels in the form of petrochemicals.

THE SUPER TEAM



AMAN SINGH

- Managing Team And Proposing Ideas For Betterment Of Project.
- Market Analysis ,Product ,Growth And Strategy.
- 4th Year Student At IIT BHU.



SAHIL ALI SALMANI

- Design Lead
- Social Media Marketing Manager; UI/UX
- 4th Year Student At IIT BHU.



AANCHAL SINGH

- CTO (Chief Technology Officer)
- Developing Ai Models ,And Linking It With The Current Prototype
- SDE II Sharechat.



KAUSHIKI BHADAURIA

- Collaborating With The OEMs In Order To Integrate OEM Parts To AI Model.
- 4th Year Student At IIT BHU.

ACHIEVEMENTS

- Ranked 1st Among 700+ Teams Across The World : Build A Better Tomorrow Hosted By Hackerearth.
- Ranked 1st Among 1000+ Teams Across The World In Various B- Plan Events: XLRI , XIMB , IIM BG , IIM S , IIM R , IIM SM, PBS , KU , IIT J , IIT B , IIT KNP....
- Ranked 2nd Among 5000+ Teams Across The World : Rackathon Hosted By Rakuten.
- Ranked 2nd Among 4000+ Teams Across The Globe: Web3athon 2022 Hosted By CoinDesk, Crypto Research , Design Lab And HackerEarth.
- Ranked 3rd Among 1300+ Teams Across The World: Designing A Sustainable Future Using ICTs Hosted By TDRA Dubai And WSIS Forum 2022.
- Ranked Among Top 5 Teams All Over India : Hack Of PI , Hosted By PAN IIT Alumni Association Among 535+ Teams.
- Ranked 3rd Among Teams Across All IITs: IS3:IDeathon On Sustainable Smart Systems Hosted By ACM Student Chapter IIT Jodhpur.
- Top 25 Teams Chosen To Be Funded By Celo Foundation Among 1500+ Teams: Hackathon Of Hope With Celo ,Hosted By United World College Costa Rica And Celo Foundation.
- Ranked 3rd Among 1000+ Teams Across The World: Urbanize Away Hosted By Hackerearth.
- Only Team Selected From India & Ranked 3rd Among 5000+ Teams Worldwide: VOIS International Hackathon Hosted By Vodafone Intelligent Solutions.



XLRI
Xavier School of Management
Mumbai, India



Praxis
CELEBRATE YOUR MIND



XAVIER INSTITUTE
OF MANAGEMENT



KALINGA
UNIVERSITY



Festival of Hope



Disrupt
National B-plan Competition 2023

ADWITEEYA

HACKATHON



Youth
Entrepreneurship
Summit
IIM BODH GAYA

Urbanize Away

RAKATHON
CODE THE FUTURE...



Build a Better Tomorrow

PI-WOT
PANIIT-
WORLD OF
TECHNOLOGY

VOIS
INTERNATIONAL
HACKATHON



Crypto Research
& Design Lab

IMPORTANT LINKS

IS ALGAE USED IN THE PRODUCT POISONOUS IN NATURE?

The mother culture of a variety of algae named Chlorella Vulgaris is been used in our product AI TREE. Chlorella vulgaris showed **no toxicity** at the dose of 2000 mg kg⁻¹ BW. In conclusion, C. vulgaris can be categorized as unclassified according to the Globally Harmonised Classification System (GHS) for chemical substances and mixtures.

SOURCE-

<https://link.springer.com/article/10.1007/s10811-020-02195-0#:~:text=Chlorella%20vulgaris%20showed%20no%20toxicity,for%20chemical%20substances%20and%20mixtures>

WORKING-

- Sensor cluster-
- Arduino
- NODEMCU - ESP8266
- Water Temperature Sensor: DS18B20
- Humidity sensor : DHT11
- Water Level Sensor
- Lighting sensor
- CO2 sensor
- PID Controller
- Cloud-based infrastructure
- Custom spectrophotometer to measure algae density with automated valves
- Custom CV enabled automated microscope to measure cell health
- Conveyor pump system eases the strain on algae
- Full growth and maintenance web dashboard interface
- Data API for centralized retrieval of AI TREE data

MODEL:

- The device is based on a **closed-system model**, with every part of the growth process being tightly controlled and optimized with machine intelligence to maximize CO2 consumption.
- Pairing with a **mobile application** that will provide the status of the carbon capture, will detect anomalies, and provide current and historical reporting of CO2 sequestration and biomass production. A **cloud-based infrastructure** can then connect multiple devices, **allowing them to learn from each other**, optimize for new environments, and provide **global insights**.
- The bigger vision is of collecting data from the interconnected network of algae reactors to globally communicate and continuously optimize devices

REPOSITORY LINK-

<https://github.com/1701aman/AI-Tree>

VIDEO-

<https://youtu.be/b9vXh5oj83Q>

SOURCE CODE-

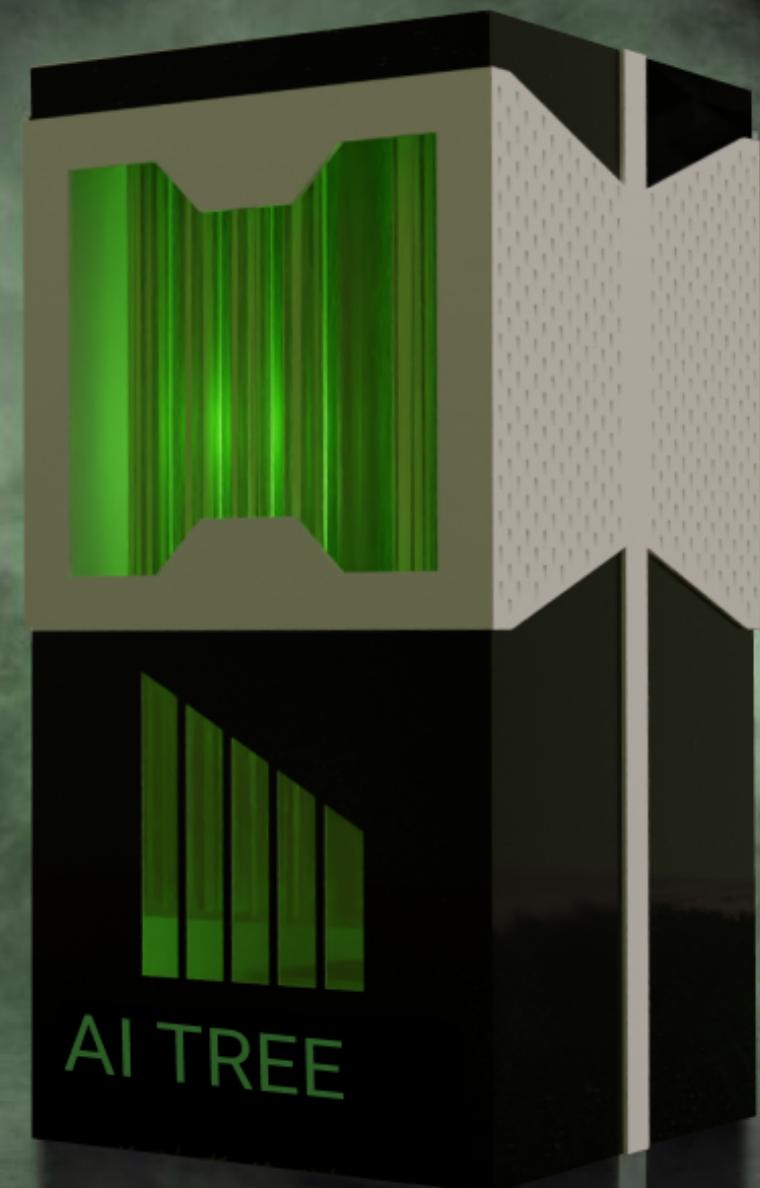
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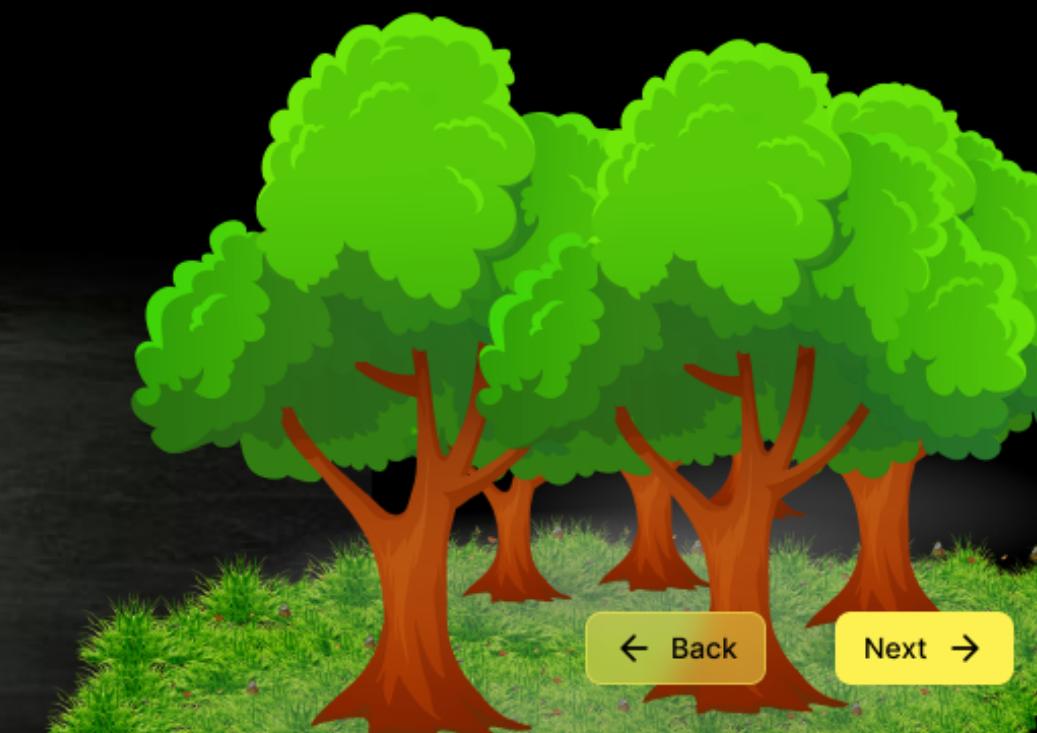
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THANK YOU



1 AI TREE = 400 TREES



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