Cesar Jung-Harada

National Press Foundation's International Trade Reporting Fellowship in Singapore
2023/07/23

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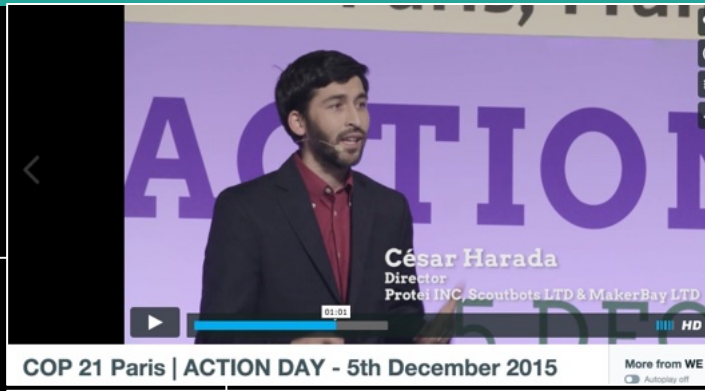
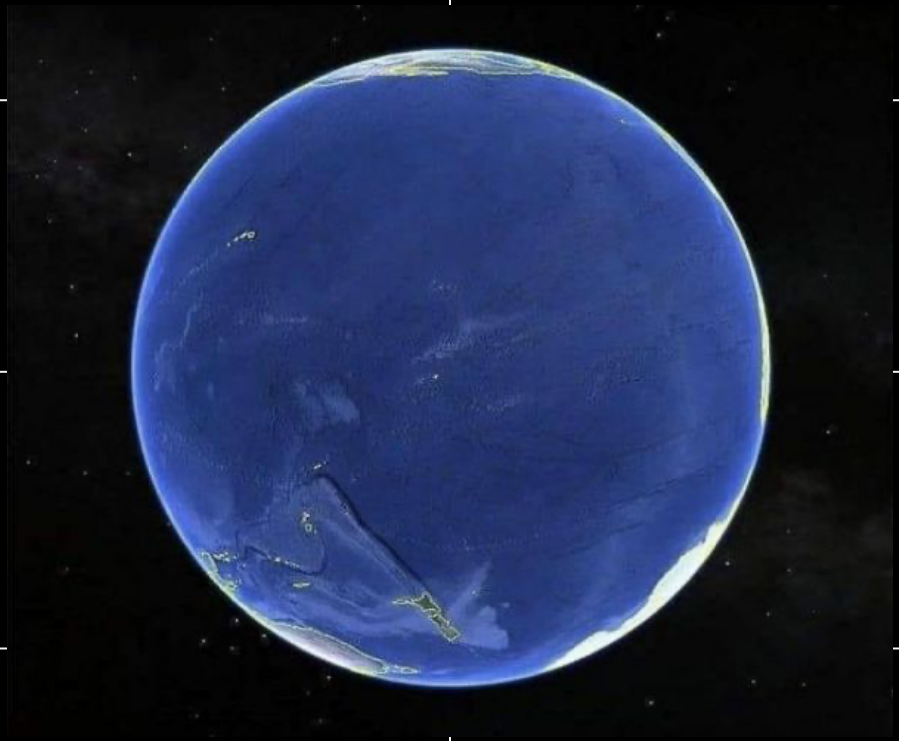


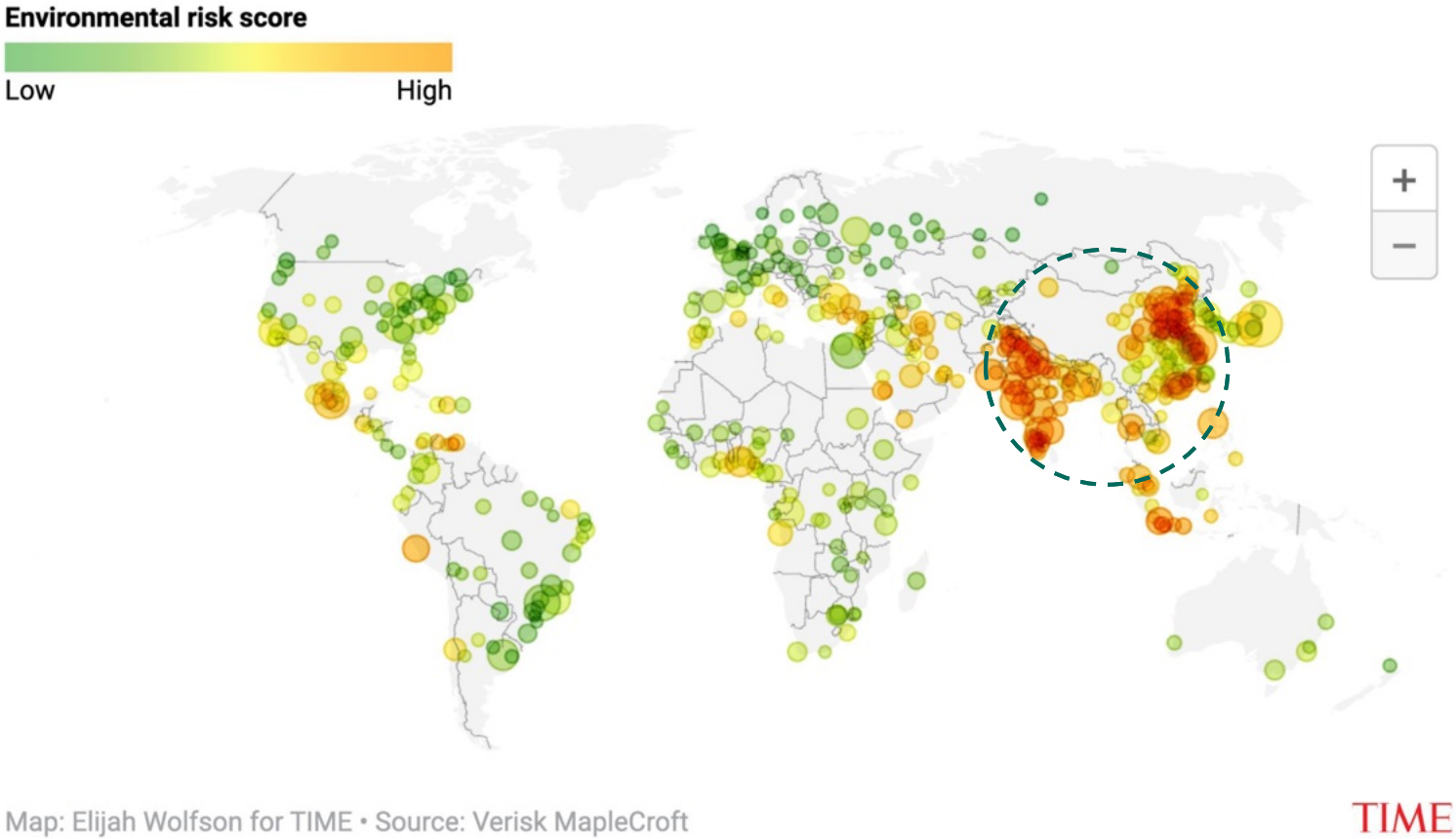
1. The Ocean is the Climate Main Controller

71% Of the “Earth” is “Water”



2. Asia will be most affected by climate change

“Asia Is Home to 99 of the World’s 100 Cities Facing the Greatest Environmental Challenges”



https://time.com/6048106/asia-environment-risk-cities/

2. Young and Indigenous People are the Most Vulnerable

Indigenous Youth Are the Most Strategic Conservationists

“Indigenous people’s traditional lands account for less than 22% of the world’s land area, they protect 80% of the world’s biodiversity. And this protection is not passive: Indigenous-led projects are a vital part of the conservation movement across the world.” - World Bank

- https://news.mongabay.com/2022/03/podcast-indigenous-peoples-the-worlds-top-conservationists/
- https://www.survivalinternational.org/conservation
- https://www.unep.org/news-and-stories/story/unsung-heroes-conservation-indigenous-people-fight-forests
- https://www.nytimes.com/2021/03/11/climate/nature-conservation-30-percent.html

Photo: An outrigger canoe off Bougainville, Papua New Guinea. Credit Georg Berg/Alamy

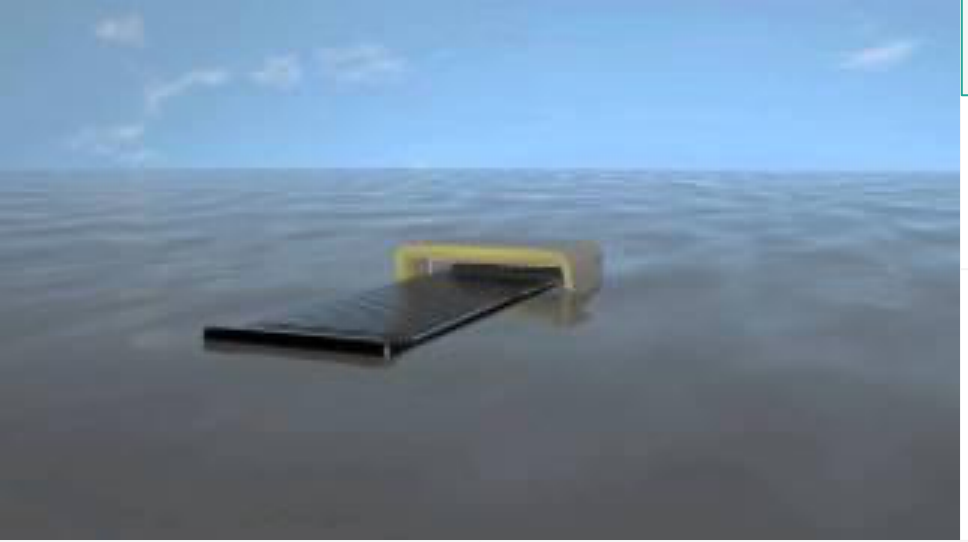
A. Oil

BP Oil Spill, 2010, Gulf of Mexico

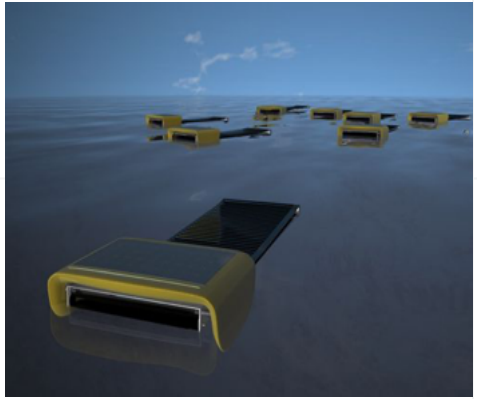
https://www.britannica.com/event/Deepwater-Horizon-oil-spill

https://www.latimes.com/nation/la-na-gulf-anniversary-20150418-story.html

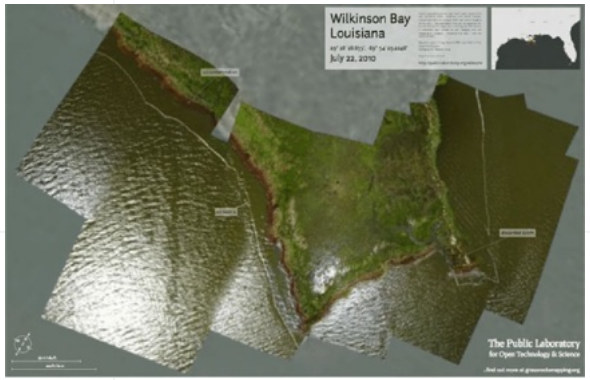
“SeaSwarm” MIT, 2010



By autonomously navigating the water’s surface, Seaswarm proposes a new system for ocean-skimming and oil removal.Seaswarm uses a photovoltaic powered conveyor belt made of a thin nanowire mesh to propel itself and collect oil. The nanomaterial, patented at MIT, can absorb up to 20 times its weight in oil. The flexible conveyor belt softly rolls over the ocean’s surface, absorbing oil while deflecting water because of its hydrophobic properties.
https://senseable.mit.edu/seaswarm/ss_prototype.html



Louisiana Bucket Brigade, 2010, New Orleans



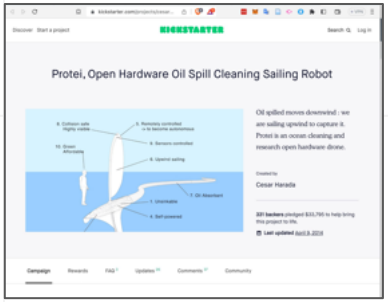
The Public Laboratory for Open Technology and Science

LOUISIANA BUCKET BRIGADE
Clean Air. Justice. Sustainability.

publiclab.org

“Protei” #Naval Architecture, 2010

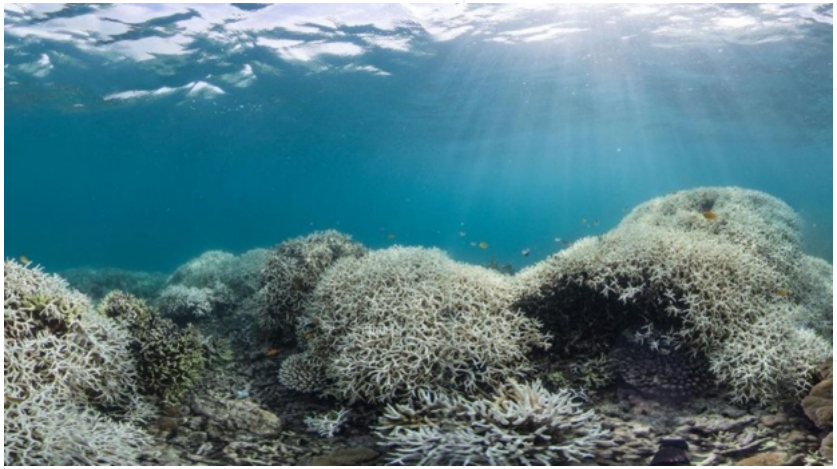
“Protei” is the name of the shape-shifting hull technology, inspired by the name of the Greek god “Proteus” that can change shape at will. In the same way that sailboats can adjust and trim the shape of their sails, Protei technology allows to dynamically change the shape of the hull, improving trajectory and payload control, stability, maneuvering, reducing drag and fuel. I discovered and licensed this technology as open hardware and used crowdfunding to support the early development. A similar technology is now under development by MIT, NASA and Boeing.



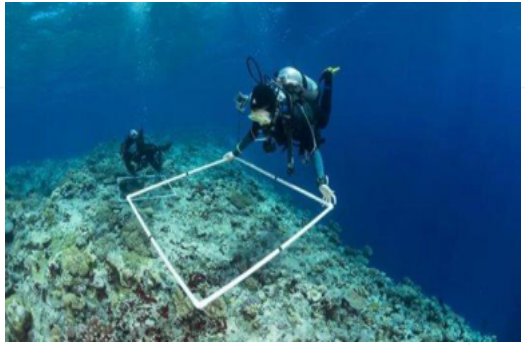
B. Coral

A bleak outlook...

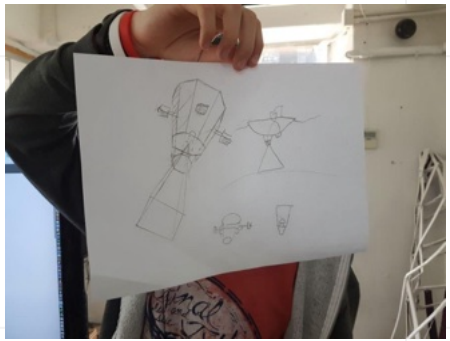
2050: 90% dead

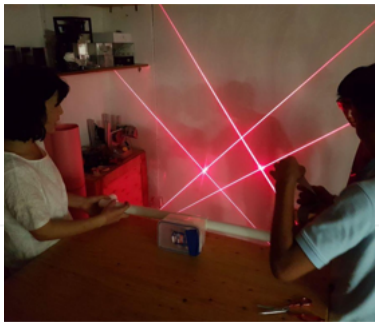


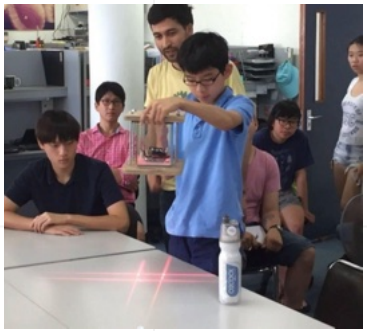
2100: 99% dead



The Imagination of Kids

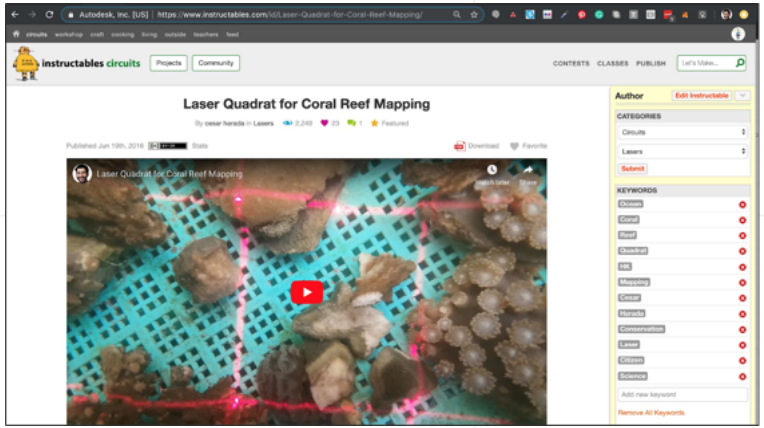





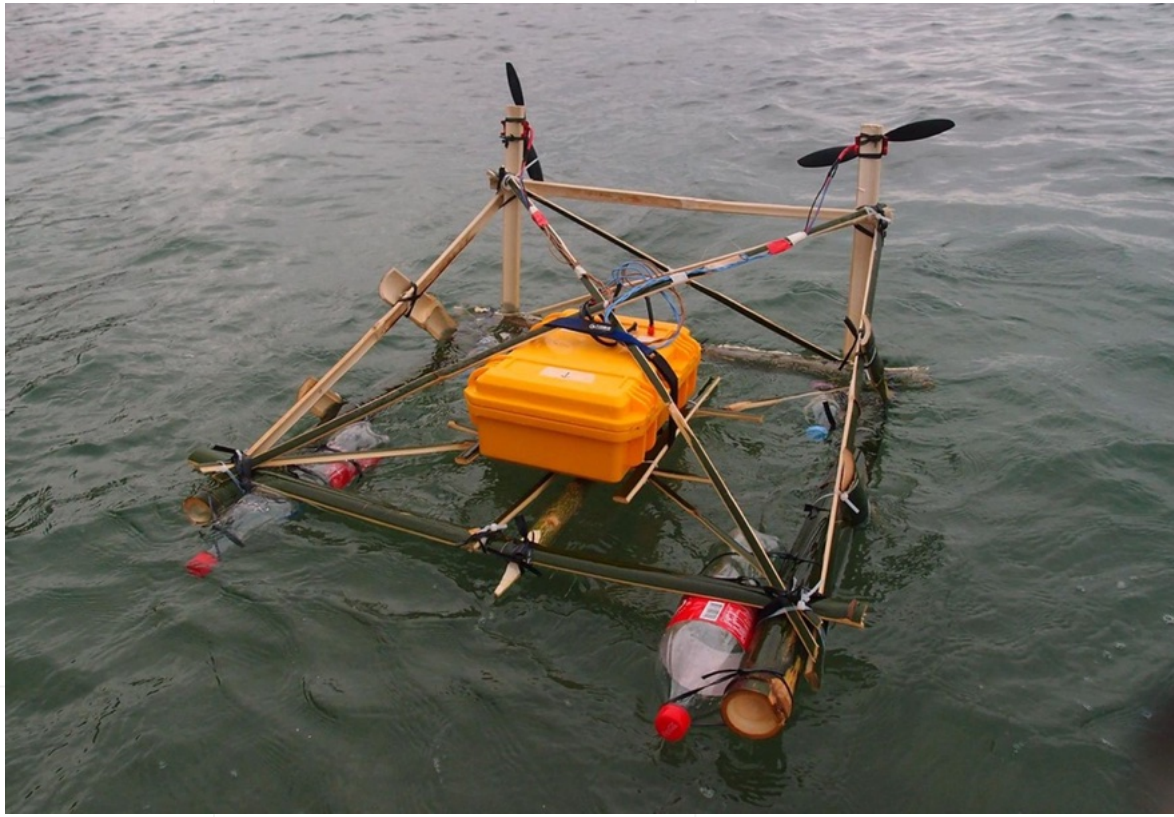
THE HARBOUR SCHOOL
Unlocking the best

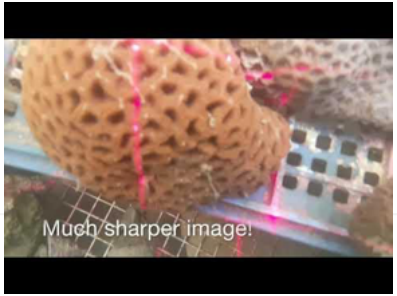
Testing in the Field

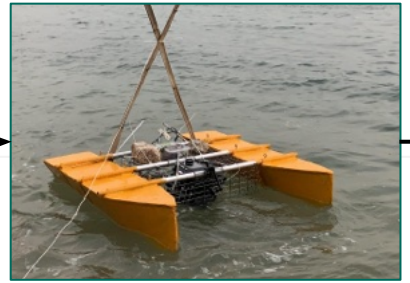


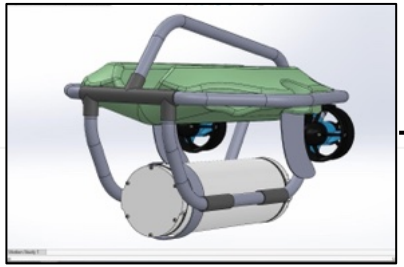
THE HARBOUR SCHOOL
Unlocking the best

Research Grant with the University of Hong Kong







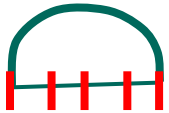


Quadrat
2016 June

Mindorobot
2017 July

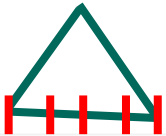
Mustard
2018 July

Turtle
2020 Mar



Bow and Arrow 2020 June

Dream Catcher 2020 July

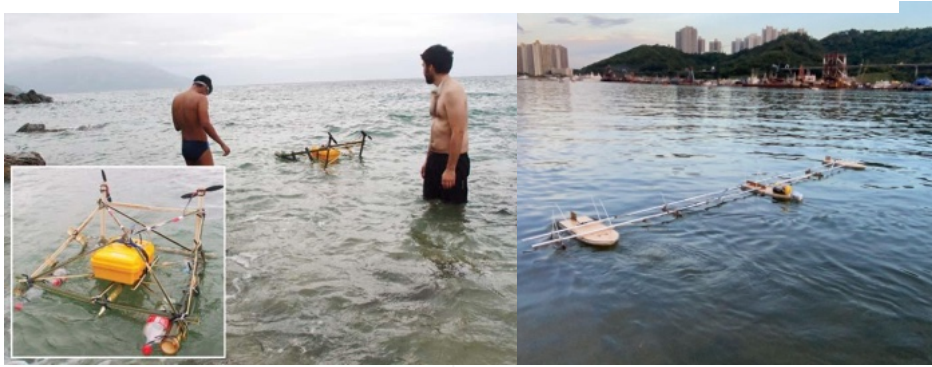


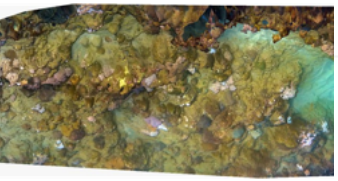
Delta Force 2020 July

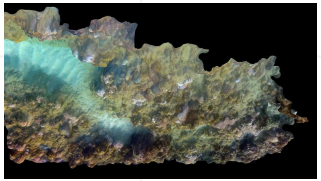
Ladder 2020 Aug

“CoralBot” #Coral #AI, 2018

CoralBot maps corals reefs with drone, photogrammetry and AI technology. Potential impact: map coral reefs and develop coral restoring techniques orders of magnitude faster and cheaper than current state of the art. This technology inspired my students to develop the ocean cleaning robot startup ClearBot.dev now funded by RAZER.







MakerBay

PIX4D

Agisoft Metashape

Darwin Automated Image Annotation

YOLO

“Clearbot” #Ocean Trash #AI, 2021

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F PROFILE

Clearbot

Cofounders, Clearbot

About Clearbot

Cofounded by Gupta and Goel, Clearbot started in 2019 as a student project to help Indonesian surfers clean up waterways. The Hong Kong-based company builds self-driving electric boats that collect rubbish, perform remote inspections and deliver cargo. With a 20-kilometer range and 200 kilogram payload capability, Clearbot has participated in cleanup projects in Hong Kong and India and won competi

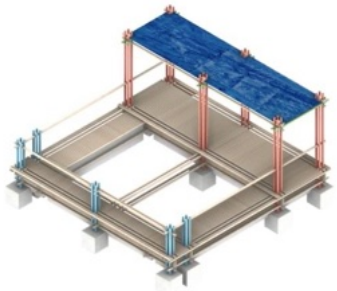
Read More

MakerBay

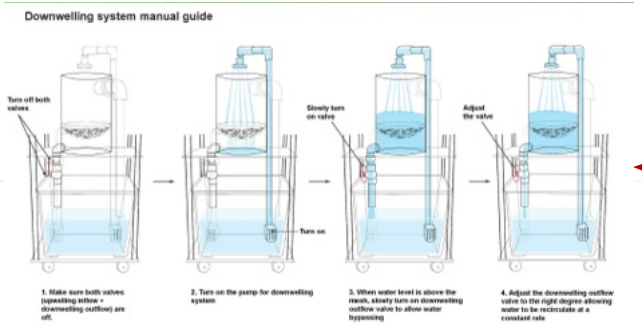
C. Oyster

“Floating Marine Lab” #Oyster, 2019

Low cost high tech fish and oyster farming systems
Potential impact: reduce overfishing, provide better livelihood for coastal, river and lake communities.

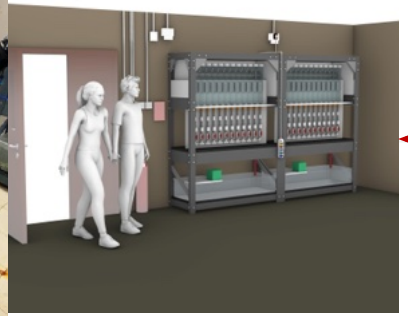


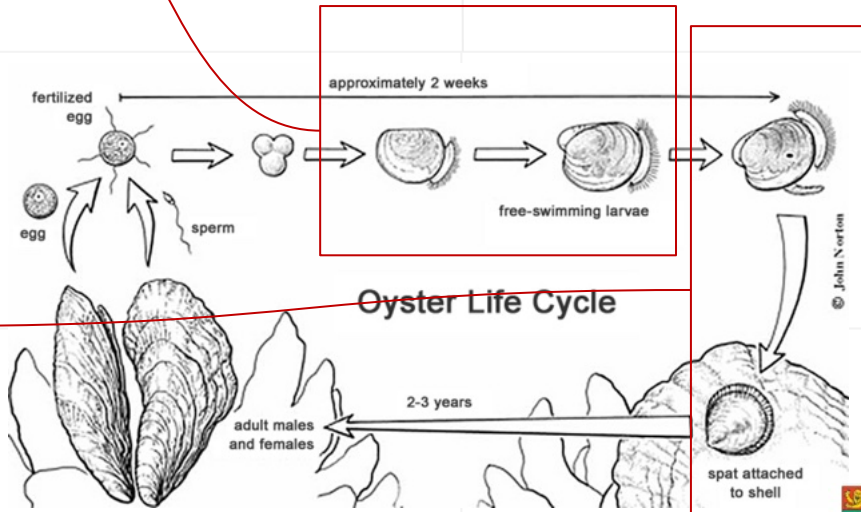
Oyster Hatchery System



This environment mimics the tide movement with upwelling and downwelling. Our specific design allows for fine control and measurement of environmental parameters such as temperature, Ph, dissolved oxygen, salinity and further sample analysis can tell us about the chemistry of the water.

1. Research, Faster parallel testing
2. Usability
3. Continuous digital measurements
4. Remote monitoring



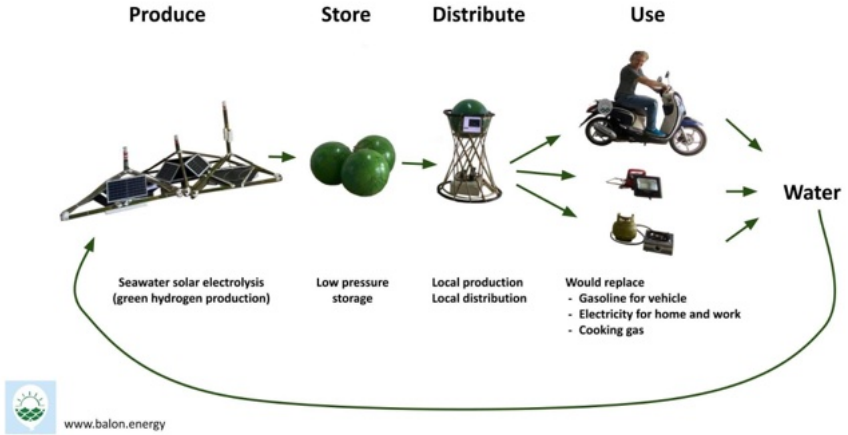


“Ocean Imagineer” #Hydrogen, 2021

The "Ocean Imagineer" is the pilot combination of an oyster farm and floating solar hydrogen plant pilot that I designed and built. The 12m long, 6m wide, 4m high floating structure demonstrates that we can produce green hydrogen offshore while contributing positively to marine biodiversity. Textile artwork commissioned to Kay Wong. Funded by the Hong Kong Art Centre, and the NEAR Foundation, exhibited in North Point and Lau Fau Shan, Hong Kong.

D. Crabs

“Balon Balo Ijo” #Hydrogen, 2022

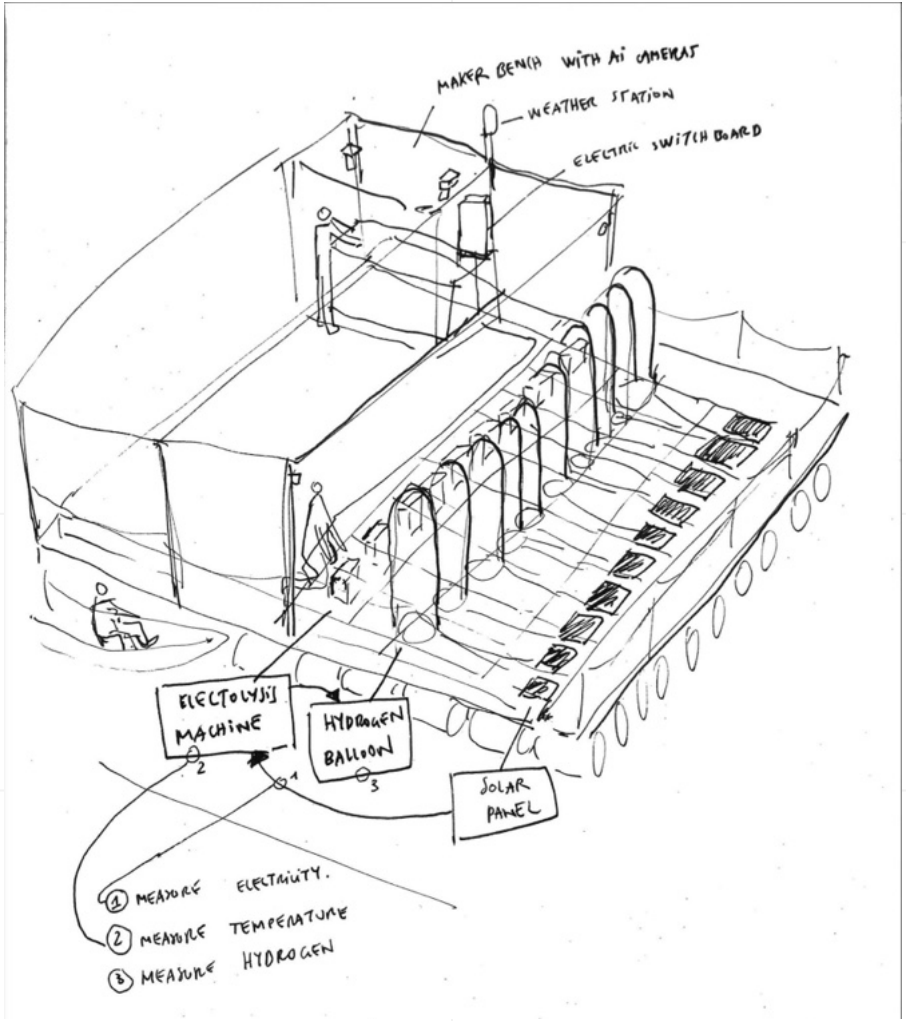


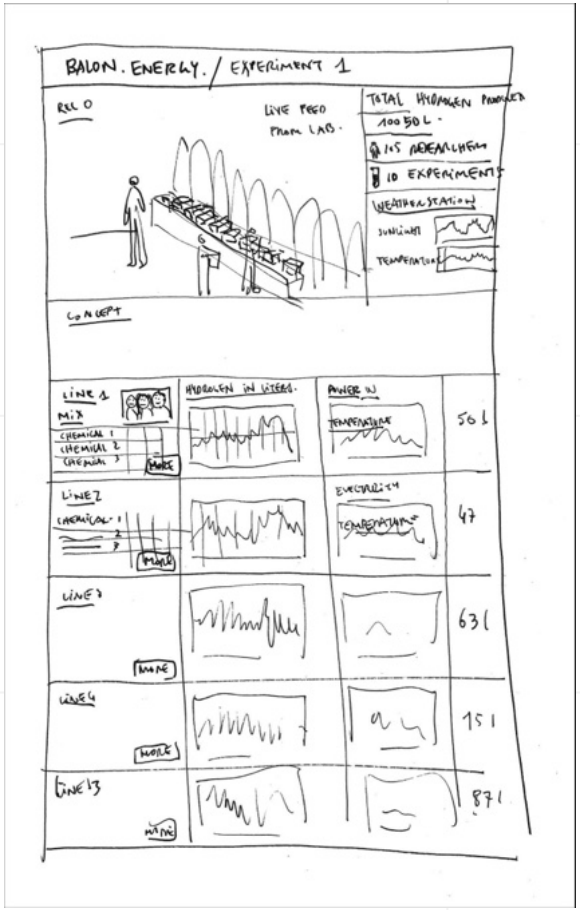
What if coastal communities could produce their own clean energy from the sea? Prototyped in Bali, Balon Balo Ijo is speculative energy system:

- **Production**: Floating solar hydrogen electrolyzer
- **Store & Transport**: Low pressure hydrogen balloons
- **Distribution** point with fuel cell, compressor

That hydrogen can be used for electricity, gas cooking, transportation.
Low pressure hydrogen is cheaper and safer to produce is the ocean is vast…

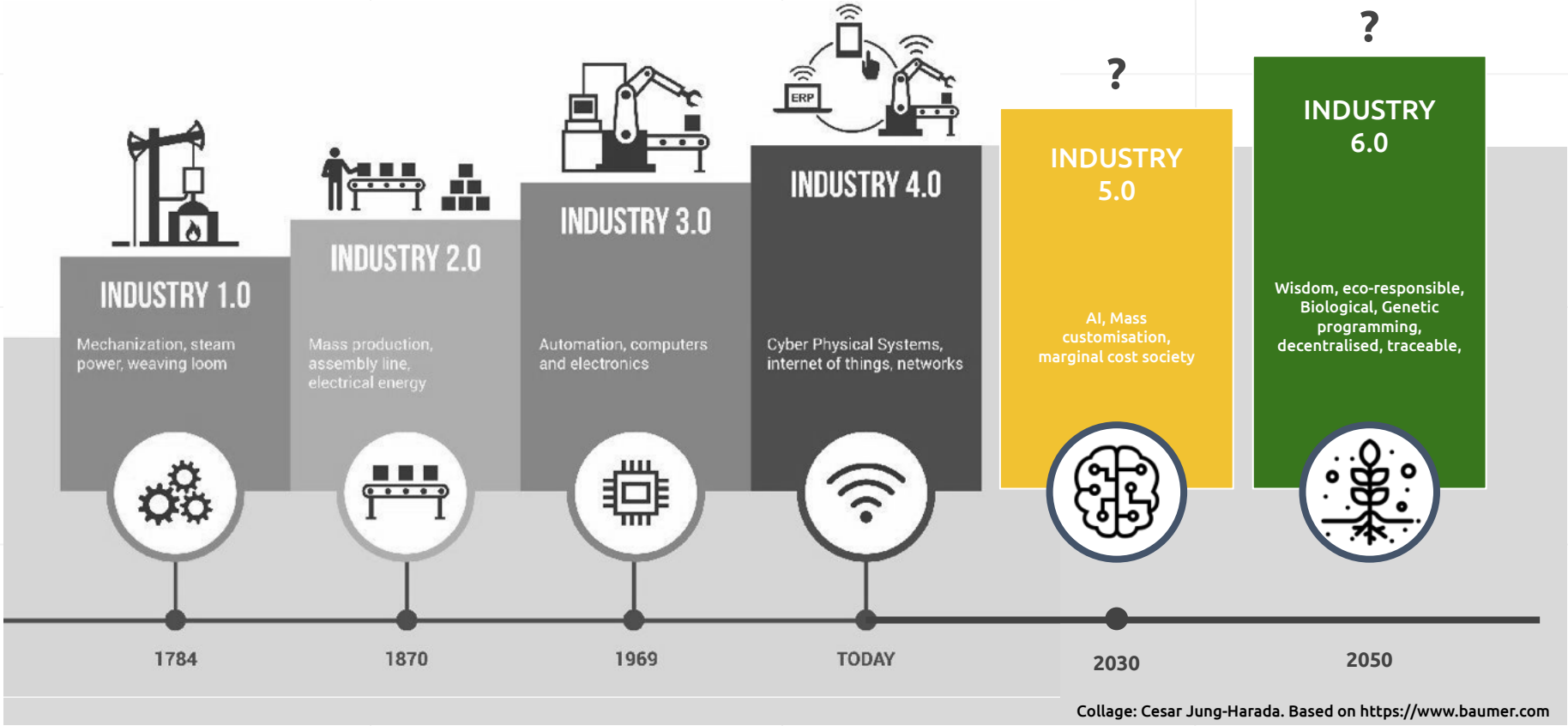
“Balon.Energy” 2023, Indonesia





Conclusion

The Industrial Revolution We Need



Collage: Cesar Jung-Harada. Based on https://www.baumer.com

The Coming Challenges

Collage: Based on McKay

- Open Science
- Youth, Indigenous, Women
- Decentralised and Anti Colonial

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