

# PROTOTYPES FOR HUMANITY



## 2023 Prototypes for Humanity Announce Winners of \$100,000 Prize at COP28

*Students with world-changing ideas, from Princeton and Oxford to Quito and Seoul win prize supporting innovation in critical areas*

**UNDER EMBARGO UNTIL 1.30PM GST 3rd December 2023**

- The world of academic ingenuity and entrepreneurship came together in a series of events in the week of COP28's opening, focused on innovation-backed solutions that can accelerate real change.
- A prize of \$100,000 has been awarded at COP28 across five priority areas of this year's COP agenda: 'Nature, Food and Water Systems', 'Health, Relief and Safety', 'Energy, Efficiency and Waste', 'Education, Equality and Communities' and 'Data Science and AI-Enabled Solutions'.
- Projects spotlight the role of academic innovation in creating the technologies necessary to achieve COP28 commitments, from emissions to emergency-response and government transparency.

**UK, London, 3<sup>rd</sup> December 2023:** Engaging university talent across all fields of natural sciences, humanities, and technology from around the globe, the 2023 edition of 'Prototypes for Humanity' successfully concluded its week of events engaging the bright minds behind 100 pioneering inventions to solve environmental and social problems. The culmination of the 2023 edition took place on Saturday 2 December at COP28 where \$100,000 cash award was distributed among the five best projects selected by an international jury.

The five winning projects in the Prototypes for Humanity Awards 2023 are (i) a synthetic yeast to enhance sustainable production of food and biofuels, (ii) a medicine-injection device optimised for emergency disaster scenarios, (iii) bioplastics made from invasive weed supporting local communities, (iv) a satellite monitoring tool to prevent negligence-caused disasters and (v) AI to detect suspicious activity in public procurement processes.

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The cash prizes seek to support continued research in critical areas, awarding the students and professors working towards exceptional solutions. The Award is one of the highlights of a week-long programme at the beating heart of Dubai's innovation ecosystem, which brought international experts in the fields of ventures, innovation, research, and investments to support university creators to move their projects towards implementation. Discussions evolved around students' technologies, which in turn reflect global urgent topics and concerned industries, such as energy, construction, healthcare, consumer goods, agriculture, soil and water.

The official opening of the 2023 edition was held on Tuesday 28 November at the Museum of the Future, to celebrate a new partnership with the Dubai Future Foundation, followed by an exhibition tour attended by **His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum**, Crown Prince of Dubai and Chairman of The Executive Council of Dubai and **Her Highness Sheikha Latifa bint Mohammed bin Rashid Al Maktoum**, Chairperson of the Dubai Culture and Arts Authority (Dubai Culture) and member of the Dubai Council, who commented:

*“Aligned with Dubai's vision, the Prototypes for Humanity community strives to create a brighter future for all of humanity. This year's award recipients, through their scientific ingenuity and creative brilliance, have presented tangible solutions to address and mitigate a wide spectrum of challenges, spanning from humanitarian crises to CO2 emissions. The winning solutions serve as vital reminders of the profound impact young innovators can have in redefining and shaping our world. Their accomplishments remind us that we can deliver our commitment to creating a better planet only if we prioritise education and innovation in our strategies. Dubai is dedicated to supporting these young innovators and will actively invest in the winning projects to address climate change, thereby enhancing a sustainable and hopeful future for everyone.”*

Prototypes for Humanity is held under the patronage of Her Highness Sheikha Latifa bint Mohammed bin Rashid Al Maktoum, who also chaired the 2023 Awards jury, which included key figures in the innovation, ventures and humanitarian-support space: Dr. Christine Gulbranson Founder, CEO and Managing Partner of Nova Global Ventures, Kristoffer Gandrup-Marino, UNICEF Chief of Product Innovation, H.E. Khalfan Belhoul, CEO of the Dubai Future Foundation, Chris Drake, Founder and CEO of Hodges & Drake. The winning projects are crowned from an original pool of over 2,800 submissions to the programme, hailing from more than 200 different research fields within 710 universities across all continents.

Dubai Future Foundation's CEO, **H.E. Khalfan Belhoul** comments *“At Dubai Future Foundation we look to empower initiatives that embrace Dubai's vision to create a better future - and are*

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*pragmatic about achieving goals. The awardees we met today are a testament to how Prototypes for Humanity's community is a force for good, which we look forward to nurturing through the emirate's infrastructure and supporting mechanisms".*

The 2023 edition consolidates the programme's status as a leading innovation and talent pool of global scale. Graduates from renowned universities worldwide, such as Yale, Stanford, Oxford, Princeton, Berkeley, MIT, Harvard and Cambridge, have contributed a diverse range of projects, besides a unique show of strength by leading regional universities across 100+ countries, from Brazil, India, China and South Africa through to Italy, Spain, Germany and Switzerland. The collective of solutions displayed in Dubai demonstrated the unwavering potential of academia – and the need for complementing approaches – to solve complex issues.

Dubai International Financial Centre in its capacity of founding partner of Prototypes for Humanity continues its commitment to support the next wave of entrepreneurs accelerate in the space of sustainable innovation. DIFC will offer selected projects from Prototypes for Humanity complementary Innovation Licenses. The licence enables the budding entrepreneurs to establish in DIFC and benefit from access to co-working spaces, mentorship and training, PE and VC networks and venture building studios.

**Arif Amiri**, Chief Executive Officer, DIFC Authority and Chairman of the Board of Art Dubai comments *"The Art Dubai Group's mission for the past 17 years has been to empower the growth of the creative and innovation ecosystems of Dubai, through the establishment of world-class initiatives that both leverage and support the city's status as a global future-forward multicultural hub. We are delighted that Prototypes for Humanity, one of our programmes, continues to grow so seamlessly aligned to this mission, as we eagerly support the next wave of entrepreneurs in the space of sustainable innovation."*

**Tadeu Baldani Caravieri**, Director, Prototype for Humanity comments: *"Academia has been a catalyst for progress, possessing the ability to identify, deconstruct, and solve problems in an independent environment, thus playing a vital role in driving change. While global sustainability objectives are shaped by commitments and accords among nations and organizations, like those being deliberated at COP28, the advancement towards these goals relies on the development of new technologies – an area where the Prototypes for Humanity community excels. Today we have helped some of those brilliant ideas from take a further step to making a world a better place."*

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## Prototype for Humanity 2023 Awardees

**Category:** Energy, Efficiency and Waste

**Winner:** Synthetic Yeasts for Biotechnology, Princeton University, José de Jesus Montano Lopez

The Synthetic Yeasts for Biotechnology project is centred on creating a synthetic version of the yeast *Saccharomyces cerevisiae* for superior chemical production. Engineered microorganisms have the potential to revolutionise renewable energy and sustainable manufacturing, producing a new generation of fuels, commodity chemicals, agrochemicals, specialty chemicals, and food products. The integrated SCRaMble technique accelerates trait evolution, enabling rapid advancement in desired characteristics. Combined with genetically encoded biosensors, these strains efficiently optimise the production of biofuels and other valuable chemicals.

**Category:** Data sciences, AI

**Winner:** Digital Twins 4 Tailings Dams, University of Oxford, Maral Bayaraa

Digital Twins 4 Tailings Dams is a satellite-based early warning system to monitor and prevent environmental disasters in mining facilities, specifically the tailings storage facilities (TSFs). The World Bank highlights a need for 3 billion tons of metals for the energy transition, intensifying challenges for the mining sector. Remarkably, over 98% of materials like copper end up as waste, stored in TSFs. With over 30,000 TSFs globally, a quarter are abandoned and unmonitored. By integrating geotechnical engineering, satellite remote sensing, and machine learning, Digital Twins 4 Tailings Dams aspire to establish a Digital Twin system to monitor these critical infrastructures.

**Category:** Health, Relief and Safety

**Winner:** The Golden Capsule, Hongik University, Yujin Chae, Daeyeon Kim, Bai Yuan, Yeonghwan Shin

The Golden Capsule is a non-powered medicine-injection device optimised for emergency rescuers in disaster scenarios. Replacing gravity-driven systems, it employs elastic force and air pressure to consistently administer medicine for over 30 minutes to an hour, without relying on electricity or manual effort. Its transparent shell encases a medicine-filled balloon, and the device can be easily adjusted for injection speed, even achieving full-drip rates required in emergencies. Easily attachable to stretchers, it enhances rescuer efficiency, eliminating the need to manually hold intravenous packs.

**Category:** Nature, Food, and Water systems

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## Winner: Hyapak, Egerton University, Joseph Nguthiru

HyaPak converts water hyacinth into biodegradable plastic alternatives, reducing waste whilst helping eradicate an invasive species. While Nairobi produces 480 tons of daily plastic waste, of which it only recycles 45%, water hyacinth wreaks havoc in over 70 countries, blocking waterways and causing significant economic loss. HyaPak's innovative solution uses this weed to create products like biodegradable seedling wrappers, which decompose in six months. This approach addresses both environmental challenges simultaneously.

**Category:** Education, Equality and Communities

## Winner: Kapak, Universidad San Francisco de Quito, Mara Fortuny

A software application that combats corruption in Ecuador's public procurement system using data science. The software application harnesses data science and AI to combat corruption in public procurement. This government-independent system pulls data from official e-procurement websites, producing indicators of corruption risks. Through a public web portal, Kapak flags suspicious procedures, evaluates contracting entities and suppliers, and raises awareness about corruption risks. Kapak empowers citizens by enhancing transparency in an area of government historically lacking oversight, aiming to integrate advanced algorithms for improved monitoring.

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### Notes to editor:

All featured projects were invited to take part in a pioneering programme to channel the ingenuity and entrepreneurial drive from Prototypes for Humanity community for the creation of viable ventures. The intended outcome is projects that deliver tangible solutions for the planet and society, while adhering to industry and investment best-practices. This programme, dedicated to support innovators to move their projects towards market implementation, included workshops and industry-led meetings, engaging venture building experts and leaders from the private and public sector - the underlying principles included how innovators and industry can collaborate and co-build solutions, and how Dubai's infrastructure can be leveraged to pilot and scale projects. It also included special sessions for professors from across the world, aimed at finding research synergies across multiples disciplines and countries. The program involved 15 discussion groups with 25 Experts on topics such as Growth, Go to Market, IP and

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Legal, and Product Roadmap, in addition to industry round tables on Healthcare, New Materials, Investment and Agri-tech. Students were also welcomed at DIFC Innovation Hub to explore the supporting mechanisms, ecosystem and future plans of the regions largest innovation hub.

## **The Programme's Opening Ceremony on November 28<sup>th</sup> included speeches by:**

H.E. Khalfan Belhoul, CEO, Dubai Future Foundation

Arif Amiri, CEO, Dubai International Financial Centre

Kristoffer Gandrup-Marino, UNICEF Chief of Product Innovation

### **About Prototypes for Humanity**

Prototypes for Humanity is the most comprehensive assembly of academic talent and innovations that has the power to change the world. The initiative promotes and supports solutions addressing environmental and societal challenges, by mobilizing academia, private and public sector. As part of its annual programme, Prototypes for Humanity celebrates the role of university innovation as an engine for prosperity, and creates mechanisms to enable solutions and knowledge to produce real-world impact. An initiative by the Art Dubai Group, Prototypes for Humanity is held under the patronage of Her Highness Sheikha Latifa bint Mohammed bin Rashid Al Maktoum, Chairperson of Dubai Culture & Arts Authority, and member of the Dubai Council, with Dubai Future Foundation as a lead partner, Dubai Culture & Arts Authority as strategic partner and supported by Dubai International Financial Centre (DIFC). To learn more about Prototypes for Humanity, please visit: <https://www.prototypesforhumanity.com/>

### **About Dubai Culture & Arts Authority**

Dubai Culture and Arts Authority (Dubai Culture), under the leadership of Her Highness Sheikha Latifa bint Mohammed bin Rashid Al Maktoum, is committed to enriching Dubai's cultural scene based on the UAE's heritage, and is building bridges of constructive dialogue between various cultures to enhance Dubai's position as a global centre for culture, an incubator for creativity, and a thriving hub for talent. Dubai Culture is keen on reviving and preserving the emirate's historical heritage and developing the regulatory frameworks for the cultural and creative sector in line with its strategic roadmap 2020 – 2025.

The Authority also seeks to empower the enablers that seek to support talent and stimulate active participation from society members by investing in the various cultural and heritage assets under its remit, including the management of six heritage sites, five museums, Al Jalila Cultural Centre for Children and eight Dubai Public Library branches, all of which help contribute to creating an economic system that stimulates the cultural and creative industries. For more information, please visit the Authority's website [www.dubaiculture.gov.ae](http://www.dubaiculture.gov.ae)

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## About Dubai Future Foundation

Dubai Future Foundation anticipates, designs, and drives Dubai's future within a cohesive, collaborative framework. We foresee challenges, explore new opportunities, and aspire to make Dubai one of the most future-ready cities in the world and a key player in crafting an optimal future for all. Our main aim is to establish Dubai as a global benchmark for designing an inspiring, progressive, and sustainable future. Our role is to support in bringing the future of Dubai into the present, setting an inspiring precedent for future-focused cities. With our ambitious, bold, and influential approach, we foster a culture that embraces foresight as a way of work and life. How do we do it? We set Dubai's role as a global hub for testing and pioneering future solutions and technology. We also convene the world's top futurists. In parallel, we embrace ideation and advanced technology, facilitating the adoption of advanced technology across various sectors through influential partnerships aimed at constantly advancing business, legislative, and regulatory environments. We also promote participatory and collaborative work among various entities and partners, supporting the startup and entrepreneurial communities. This is all supported by a commitment to experiencing the future, providing immersive experiences for individuals to live the future today. [www.dubaifuture.ae](http://www.dubaifuture.ae)

## About Dubai International Financial Centre

Dubai International Financial Centre (DIFC) is one of the world's most advanced financial centres, and the leading financial hub for the Middle East, Africa and South Asia (MEASA), which comprises 72 countries with an approximate population of 3 billion and an estimated GDP of USD 8 trillion. With a close to 20-year track record of facilitating trade and investment flows across the MEASA region, the Centre connects these fast-growing markets with the economies of Asia, Europe and the Americas through Dubai. DIFC is home to an internationally recognised, independent regulator and a proven judicial system with an English common law framework, as well as the region's largest financial ecosystem of over 39,000 professionals working across over 4,900 active registered companies – making up the largest and most diverse pool of industry talent in the region. The Centre's vision is to drive the future of finance through cutting-edge technology, innovation, and partnerships. Today, it is the global future of finance and innovation hub offering one of the region's most comprehensive FinTech and venture capital environments, including cost-effective licensing solutions, fit-for-purpose regulation, innovative accelerator programmes, and funding for growth-stage start-ups. Comprising a variety of world-renowned retail and dining venues, a dynamic art and culture scene, residential apartments, hotels and public spaces, DIFC continues to be one of Dubai's most sought-after

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business and lifestyle destinations. For further information, please visit our website: [difc.ae](http://difc.ae), or follow us on LinkedIn and Twitter @DIFC.

## PARTNER AGENCIES

**International BROADCAST:** Markettiers

**Newsroom**

[newsroom@markettiers.com](mailto:newsroom@markettiers.com)

+44207 253 8888

**Nathan Speller**

[Nathan.Speller@Markettiers.com](mailto:Nathan.Speller@Markettiers.com)

**Print / Digital**

**UAE & GCC:** Asda'a BCW

**Fatima Alarda**

[Fatima.Alarda@bcw-global.com](mailto:Fatima.Alarda@bcw-global.com)

+971 4 450 7669

**Silvia Santos**

[silvia.santos@bcw-global.com](mailto:silvia.santos@bcw-global.com)

+971 52 542 5394