PRESS RELEASE

Robotics meets the culinary arts

From left to right: Bokeon Kwak, EPFL; Valerio Galli, IIT; Julien Boutonnet, EHL

Lausanne, Switzerland, 14th April 2025 – A Swiss Italian team has created RoboCake, a robotic wedding cake that showcases the advances in robotic food research. The project was unveiled yesterday at the Expo 2025 Osaka.

RoboCake is ready. This edible robotic cake is the result of a collaboration between researchers from EPFL (the Swiss Federal Institute of Technology in Lausanne), the Istituto Italiano di Tecnologia (IIT-Italian Institute of Technology) and pastry chefs and food scientists from EHL, Hospitality and Business education group, in Lausanne. It takes the form of a robotic wedding cake, decorated with two gummy robotic bears and edible dark chocolate batteries that power the candles. The project was unveiled yesterday at the Swiss Pavilion of the Expo 2025 Osaka through captivating video and images.

The idea of creating edible robots or foods that behave like robots may seem weird, but it is a real challenge that the scientific community is tackling. An international research group is working on this as part of the RoboFood project. Funded by the EU and coordinated by EPFL, it aims to develop a new generation of edible robots and intelligent food.

"Robotics and food are two separate worlds," says Dario Floreano, head of the Laboratory of Intelligent Systems (LIS) at EPFL and coordinator of the RoboFood project. "However, merging them offers many advantages, particularly in terms of limiting electronic waste and food waste." Other applications in the fields of emergency nutrition and health are being considered by scientists.

"Edible robots could be used to deliver food to endangered areas, to deliver medicines in innovative ways to people who have difficulty swallowing or to animals, or even to monitor food and its freshness using sensors that can be eaten."

Illustrating robotic food research

Creating edible robots also offers brand new culinary experiences. The RoboCake is an innovative way of illustrating the progress made by the RoboFood project.

The RoboCake features two completely edible robotic teddy bears, created by the LIS at EPFL. "They are made from gelatin, syrup and colorants," explains Bokeon Kwak, a researcher at LIS. "They are animated by an internal pneumatic system: when air is injected through dedicated pathways, their heads and arms move."

These dancing bears, which taste like soft sweet pomegranate gummies, are not the only special features of the cake. IIT researchers, coordinated by Mario Caironi, have developed the first edible rechargeable battery, made of vitamin B2, quercetin, activated carbon and chocolate, for the gourmet touch. "These batteries, safe for consumption, can be used to light the LED candles on the cake," explains Valerio Galli, a PhD student at IIT. "The first flavor you get when you eat them is dark chocolate, followed by a surprising tangy kick, due to the edible electrolyte inside, which lasts a few seconds". These batteries represent a potential solution to reducing electronic waste, which reaches 40 million tons per year.

The icing on the cake

To make these innovations appetizing and safe to eat, the engineers teamed up with food experts and pastry chefs from EHL. "Our challenge was to find the best way to showcase the innovations of our two partners, EPFL and IIT, by adding what we do best: indulgence. This is how the RoboCake was born, a true event pastry cake, meeting the challenge of combining technique, electronics, and taste." says Julien Boutonnet, EHL Senior Lecturer Practical Arts and France's top distinction, the Meilleur Ouvrier de France (MOF) award for pastry and candymaking.

"This interdisciplinary collaboration paves the way for interactive and delicious gastronomic experiences reminding us that food is a precious resource and possibly reducing overeating", says Dario Floreano.

You can dowload some HD photos and videos here.

About the RoboFood project

RoboFood is a 3.5-million-euro four-year research project funded by the European Union. Launched in 2021, it brings together scientists from EPFL, IIT, the University of Bristol and the University of Wageningen. The RoboFood project combines food science and robotics in a radically new way to create edible robots and robotized food for food preservation, emergency nutrition, human and veterinary medicine or new culinary experiences.

Funded by the European Union

This project has received funding from the European Union's Horizon 2020 Research and Innovation program under Grant agreement 964596.

Expo 2025 Osaka

The RoboCake project will be showcased at the Swiss Pavilion at the Expo 2025 Osaka from 13 April to 10 June 2025.

The real edible RoboCake will be revealed (and tasted!) as part of a VIP event on the 6th of June. To take part, please contact us (subject to availability).

About EHL:

EHL is an educational group and the global reference in education, innovation and consulting for the hospitality and services sector.

With expertise dating back to 1893, EHL now offers leading educational programs ranging from apprenticeships to doctoral degrees, including master's programs, professional and executive education, on three campuses in Switzerland and Singapore. EHL also provides consulting and certification services to companies and learning centers around the world.

True to its values and dedicated to building a sustainable world, EHL is committed to providing education, services and working environments that are people-centered and open to the world.

www.ehlgroup.com

About IIT:

The Italian Institute of Technology (IIT) is a state-funded scientific research center based in Italy that promotes excellence in both basic and applied research to foster national economic development. IIT's research activities are highly interdisciplinary and span four scientific areas: robotics, nanomaterials, computational sciences, and technologies for life sciences. These activities are conducted at the Central Research Laboratories in Genoa (IIT's headquarters), 11 satellite research centers across Italy,

and 2 outstations in the United States. To date, IIT scientists have produced over 22,000 publications and received approximately 70 European Research Council grants. Additionally, 37 startup companies have emerged from IIT labs, with 50 more in the launch phase.

https://www.iit.it/

About EPFL:

With its dynamic community of over 16,000 people, EPFL has created a unique spirit of curiosity and an atmosphere of open dialogue. It provides its students with solid technical knowledge while encouraging them to develop imagination, creativity and entrepreneurship in cross-disciplinary projects. At its various locations, EPFL has a strong research community working on topics such as data science, personalised health or robotics. Its research finds its way into society through knowledge and technology transfer. EPFL is an important innovation player in Switzerland and offers solutions for climate change or the ageing of the population -- for the benefit of all humankind.

https://www.epfl.ch

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