PRESS RELEASE

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Students at the Faculty of Electrical Engineering of the Czech Technical University in Prague have developed a smart bee scale. It can determine the most suitable time for honey extraction

How can beekeepers quickly, cheaply and effectively determine the best time to harvest honey? This is determined by so-called bee scales, which cost between five and twenty thousand Czech crowns on the market. Two students from the Faculty of Electrical Engineering at the Czech Technical University in Prague decided to make this technology cheaper and more accessible. As part of the Make-iton incubation programme, they built a prototype and will now look for investors.

Lukáš Kalenda and Šimon Přerovský study at the Faculty of Electrical Engineering at CTU, but they met as classmates at the Smíchov Secondary Technical School and grammar school in Preslova Street. Together, they also enrolled in the first year of the Make-iton semester incubation programme, where they created a functional prototype of a smart bee scale during the autumn and winter of 2025.

How the bee scale works

The idea came from Lukáš Kalenda, who is in his second year of the bachelor's programme in Electrical Engineering, Energy and Management (EEM). Since childhood, he has been helping his father, who keeps bees at home. "The products available on the market are relatively expensive. As a result, beekeepers only place bee scales under one reference hive. However, it is much more interesting to monitor the contents of all hives, as this gives beekeepers a broader picture of the condition of the entire bee colony. That is why we have created a simple device that uses weight to determine when the beekeeper should harvest the honey," explained Lukáš Kalenda.

Šimon Přerovský, a second-year student in the Electronics and Communications (EC) bachelor's programme, was excited by Lukáš's idea and immediately got involved in its implementation. "Beekeeping and bee scales interested me mainly from a hardware perspective. Overall, I enjoy electronics and sensors that can be used in projects related to nature," explained Šimon Přerovský.

Although Lukáš Kalenda had previous experience with beekeeping at home, the students had to have the first prototype tested by several beekeepers and improve the product based on their feedback.

The students assembled the prototype bee scale from commonly available components. Specifically, they used a simple Arduino and strain gauges. Each scale displays a graph with trends that beekeepers use to guide their work. "For example, in summer, four to five kilograms of honey are added daily, part of which is water that evaporates. This data then helps beekeepers to determine the exact time when the honey should be extracted. Whether it should be done immediately or in three days, for example," explained Lukáš Kalenda.

The students are continuing to improve the prototype and optimise both the production process and the price of components in order to make the product cheaper overall, thereby making it accessible to a larger number of beekeepers.

Now that the Make-iton programme has ended, the students are able to invest in a small series of smart bee scales. "However, we would like to enable beekeepers to place smart bee scales under all their hives, as this will allow them to obtain more honey. To achieve this, we need an investor or crowdfunding, as it requires a series of thousands, which will cost millions," concluded Šimon Přerovský.

Make-iton announces the winners of its first year

The Make-iton incubation programme operates under the Maker Institute, a joint initiative of the Czech Technical University and the University of Chemistry and Technology. It is one of the steps to better connect universities with manufacturing practice and strengthen the applied component of technical education.

"The Czech market has long lacked an incubator focused on the development of physical products. We founded Make-iton so that young talents could gain experience with real production," says Patrik Seidl, director of the Maker Institute.

During one semester, Make-iton participants had the opportunity to work on their own projects, from market research to the production of their own hardware products to their presentation, including the presentation of their marketing and market potential. From September 2025 to February 2026, student teams had access to laboratories where they could create and consult with experts.

Presentations by all 13 teams, consisting of a total of 32 university students, were held on Friday, 13 February, at the Next Zone of the Smíchov Secondary Technical School and Grammar School. The main criteria of the expert jury were the level of prototype development, market potential and quality of presentation.

First place, which comes with a financial reward of CZK 100,000, went to Pavel Karásek, a student at the Faculty of Nuclear and Physical Engineering at the Czech Technical University in Prague, and entrepreneur Jan Poláček. Their ECHO coffee table uses fibre optic technology to create a night sky effect, familiar from luxury car interiors, for example. The team transferred the technology to the furniture segment and created a fully functional design prototype.

Jan Kabíček (AOI team), a second-year student of the Electronics and Communications (EK) master's programme at the Faculty of Electrical Engineering of the Czech Technical University in Prague, came in second. He won 50,000 crowns for his project of automatic optical inspection designed for small and medium-sized manufacturing companies. Third place went to the largest student team, EDU-KIT, which developed a construction kit for polytechnic education for children.

The organisers consider the first year of Make-itonu a success and plan to continue it. "The programme filled up quickly, and the interest of the participants convinced us that a similar format has its place in Czechia. In future years, we want to connect technical education even more with practice and production," adds Patrik Seidl.

The programme was implemented with the support of the IOCB Tech Endowment Fund.

The independent Faculty of Electrical Engineering at CTU was established in 1950. Today, it consists of 17 departments located in two buildings: on the main CTU campus in Dejvice and in our historic building on Karlovo náměstí. The Faculty of Electrical Engineering provides first-class education in the fields of electrical engineering and computer science, electronics, telecommunications, automatic control, cybernetics and computer engineering.

The faculty has long been ranked among the top five research institutions in the Czech Republic. It produces approximately 30% of the research results of the entire CTU and has established extensive scientific cooperation with leading world universities and research institutes. Since 1950, the Faculty of Electrical Engineering has awarded approximately 30,000 diplomas, which have always been highly regarded as proof of first-class education. For more information, visit www.fel.cvut.cz.

The Czech Technical University in Prague is one of the largest and oldest technical universities in Europe. According to the 2017+ Methodology, it is the best Czech technical university in the group of evaluated technical universities. Currently, CTU has eight faculties (Civil Engineering, Mechanical Engineering, Electrical Engineering, Nuclear Engineering and Physical Engineering, Architecture, Transportation, Biomedical Engineering, and Information Technology). It has over 19,000 students. In the 2025/2026 academic year, CTU in Prague has a total of 279 accredited study programmes, 107 of which are in English. In addition to its faculties, CTU in Prague also comprises six institutes (Klokner Institute, Masaryk Institute of Advanced Studies, Institute of Physical Education and Sport, University Centre for Energy Efficient Buildings, Czech Institute of Informatics, Robotics and Cybernetics, and Institute of Technical and Experimental Physics). CTU educates experts in the field of technology, scientists and managers with knowledge of foreign languages who are dynamic, flexible and able to quickly adapt to market demands. According to the results of the 2017+ Methodology, CTU was evaluated in a group of five technical universities and received the highest rating of A. In the QS World University Rankings, CTU is ranked 416th. In the Subject Rankings 2024 for "Architecture and Build Environments", CTU ranks 151st–200th, in "Engineering – Civil and Structural" CTU ranks between 151st and 200th, in Mechanical, Aeronautical & Manufacturing Engineering, it is ranked 201st–250th, and in Electrical & Electronic Engineering, it is ranked 201st–250th. In Physics and Astronomy, it is ranked 201st–250th, and in Natural Sciences, it is ranked 307th. In the field of "Computer Science and Information Systems", it ranks between 201st and 250th, in the field of "Material Sciences" between 251st and 300th, in the field of "Mathematics" between 301st and 350th, and in the field of "Engineering and Technology", CTU ranks 182nd. Since 2020, CTU has been a member of the EuroTeQ alliance of prestigious technical universities. This represents an interesting and beneficial opportunity for students, researchers and staff to get involved in a project that aims to raise the quality of higher education to a higher level. Other members of the EuroTeQ group include the Technical University of Munich, the Technical University of Denmark, the Technical University of Eindhoven, École Polytechnique – L´X, Tallinn University of Technology, École polytechnique fédérale de Lausanne and the Technion Israel Institute of Technology. In 2023, the alliance was expanded to include HEC Paris and IESE Business School (University of Navarra). For more information, visit www.cvut.cz.