

## PRESS RELEASE

Sources:

Tokyo Institute of Technology

ANA Holdings Inc. (ANA Group)



For immediate release: October 12, 2022

### Event Announcement:

**Pilgrimage × Robot 2022** (Tokyo Tech×ANA Project)

**Conducted our tour in Mt. Koya, “Pilgrimage × Robot 2022” (Tokyo Tech × ANA Project), and explored the possibilities of a new walking tour based on the concept of a pilgrimage meeting robotics.**



Tokyo Institute of Technology (hereinafter Tokyo Tech) and ANA Holdings Inc. (hereinafter “ANA Group”) are exploring the possibility of a “new walking journey” created from the fusion of the ideas of “pilgrimage” and “robot.” We are inspired by the Buddhist phrase “Dogyo-Ninin”, the idea that the spirit of the ninth-century monk Kobo Daishi (Kukai), the founder of Shingon Buddhism, journeys alongside pilgrims to protect them. We are rethinking the idea of a walking journey from the perspective of “well-being,” a realignment not just of the own body, but, through synchronizing pace with the robot as a Kobo Daishi, the spirit as well, to develop and test the walking support robot to assist in this process.

In 2021, we conducted a field test in Zentsuji City, Kagawa Prefecture, for a walking

pilgrimage of the Shikoku 88 Temples Pilgrimage, and in 2022, based on the results of this test, we conducted a PoC (Proof of Concept) for a “new walking journey” through a monitor tour at the sacred Buddhist site of Mt. Koya (Koyasan). We visited the 88 temples to pray in the Osunafumi event held at Haneda Airport from September 30 to October 7, and then visited Mt. Koya on October 12 as a thank-you visit. Six participants walked 500m wearing the exoskeleton robot on the path to the two sacred sites on Mt. Koya, the central temple complex of Danjo Garan and Oku-no-in, Kukai’s mausoleum. We evaluated the effectiveness of the walking journey in terms of well-being. As a result, we confirmed that the participants' walking ability, such as walking speed and stride length, improved. Moreover, we discovered that walking with the robot could have a positive effect not only on the body but also on the "mind." Participants commented that they "felt a sense of togetherness" and "felt included" by walking in synchrony with the robot.

The walking support robot used in this project is the "Walk-Mate" developed by Miyake Laboratory of Tokyo Tech (in collaboration with Walk-Mate Lab, a Tokyo Tech venture). Walk-Mate is a wearable robot that supplements human power in accordance with your walking rhythm, as if there were a person walking with you. This system is a realization of the concept of “Dogyo-Ninin” through modern science and technology, and has already been used in medical fields such as gait training. This project aims to explore the possibility of creating a new travel style through “Pilgrimage x Robot,” as well as to support the revitalization of rural areas and to increase the mobile population following the COVID-19 pandemic.

**Please see below for photos and videos of the demonstration experiment.**

(Available for viewing until December 31, 2022)

<https://tokyotech.box.com/s/kkqwwn9g2rl8p8s0p6mxy7wphe3tjwbr>

### **Event details**

Date: Wednesday, October 12, 2022 A tour in Mt.Koya, Wakayama pref.

Organizer: Tokyo Institute of Technology x ANA

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### **About Tokyo Institute of Technology**

Tokyo Tech stands at the forefront of research and higher education as the leading university for science and technology in Japan. Tokyo Tech researchers excel in fields ranging from materials science to biology, computer science, and physics. Founded in 1881, Tokyo Tech hosts over 10,000 undergraduate and graduate students per year, who develop into scientific leaders and some of the most sought-after engineers in industry. Embodying the Japanese philosophy of “monotsukuri,” meaning “technical ingenuity and innovation,” the Tokyo Tech community strives to contribute to society through high-impact research.

<https://www.titech.ac.jp/english/>

### **About ANA HOLDINGS**

Founded in 1952 with just two helicopters, All Nippon Airways (ANA) has grown to become the largest airline in Japan. ANA HOLDINGS Inc. (ANA HD) was established in 2013 as the largest airline group holding company in Japan, comprising 70 companies including ANA and Peach Aviation, the leading LCC in Japan.

ANA is a launch customer and the largest operator of the Boeing 787 Dreamliner, making ANA HD the biggest Dreamliner owner in the world. A member of Star Alliance since 1999, ANA has joint venture agreements with United Airlines, Lufthansa German Airlines, Swiss International Airlines and Austrian Airlines - giving it a truly global presence.

The airline's legacy of superior service has helped it earn SKYTRAX's respected 5-Star rating every year since 2013, with ANA being the only Japanese airline to win this prestigious designation for nine consecutive years. ANA also has been recognized by Air Transport World as "Airline of the Year" three times (2007, 2013 and 2018); it is one of only a select few

airlines to win this prominent award multiple times.

In 2021, ANA was awarded the 5-star COVID-19 safety rating by SKYTRAX, recognizing the airline's initiatives to provide a safe, clean and hygienic environment at airports and aboard aircraft, embodied in the ANA Care Promise.

ANA is the only company in the aviation industry to receive the Gold Class distinction from the 2022 S&P Global Sustainability Awards and ANA HD has been selected as a member of the Dow Jones Sustainability World Index list for the fifth consecutive year and the Dow Jones Sustainability Asia Pacific Index list for the sixth consecutive year.

For more information, please refer to the following link:

<https://www.ana.co.jp/group/en/>