Slow Italian, Fast Learning

Ep.409: What is the secret to an elephant's grace? Whiskers.

Italian	English
Il dottor Michael Brecht si trova allo zoo di Berlino, dove osserva un gruppo di elefanti mentre usano le proboscidi per raccogliere piccoli pellet di cibo. Brecht è un neuroscienziato dell'Università Humboldt di Berlino e sta studiando la delicata destrezza di queste giganti creature. **"They are incredibly powerful animals. But on the other hand, fine manipulation is also very important for them. They can do very delicate things. We just saw that, picking up small pellets. It's not easy at all for such a huge animal to effectively handle such small items."** Il dottor Brecht sta collaborando con i ricercatori del Max Planck Institute for Intelligent Systems per colmare le lacune nelle conoscenze su come un elefante percepisce l'ambiente circostante. Assieme hanno pubblicato una nuova ricerca, condotta dal dipartimento di Intelligenza tattile dell'istituto, la quale rivela che gli elefanti hanno un senso del tatto complesso che compensa la loro spessa pelle e la loro scarsa vista. Le proboscidi degli elefanti sono ricoperte da circa 1.000 baffi che terminano con punte morbide, le quali consentono loro di percepire con precisione gli oggetti e riconoscere dove avviene il contatto. Il dottor Andrew Schulz dell'Istituto Max Planck ha svelato che la ricerca prende in considerazione come queste conoscenze	Dr Michael Brecht is at Berlin zoo, observing a group of elephants as they use their trunks to pick up small pellets of food. He's a neuroscientist at Berlin's Humboldt University, and is studying the gentle dexterity of these giant creatures. **"They are incredibly powerful animals. But on the other hand, fine manipulation is also very important for them. They can do very delicate things. We just saw that, picking up small pellets. It's not easy at all for such a huge animal to effectively handle such small items."** Dr Brecht is working with researchers at Max Planck Institute for Intelligent Systems to fill gaps in knowledge about how an elephant senses its surroundings. Together they've published new research, led by the institute's Haptic Intelligence department, which reveals elephants have a complex sense of touch that compensates for their thick skin and poor eyesight. Elephant trunks are covered in around 1,000 whiskers, and these whiskers are graduated to soft tips, which enables them to precisely feel objects and recognize where contact is made. Dr Andrew Schulz from the Max Planck Institute reveals the research considers how this knowledge can be used in the creation of robotics.

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possano essere utilizzate nella creazione di robot. **"How can an elephant completely, like, you know, eat a Christmas tree in two bites and then pick up something as delicate as a tortilla chip. This is one of the things that really started to fascinate a lot of roboticists. In a lot of the things that are human-made there are these trade-offs. If you have something that is really, really rigid, it might be very, very strong, but it's not delicate. And then if you have something that is really, really soft, it might be very delicate, but it's not very strong ."** I ricercatori hanno scoperto che i baffi degli elefanti sono simili a quelli dei gatti, che quindi differiscono dai peli sensoriali rigidi di ratti e topi. I baffi degli elefanti hanno una base rigida che gradualmente si trasforma in una punta morbida e gommosa, che permette loro di sfiorare facilmente gli oggetti senza romperli. Possono anche cercare e mangiare centinaia di chilogrammi di cibo ogni giorno senza danneggiare questi preziosi peli, che non ricrescono se si rompono. Per il dottor Schulz la biologia dell'elefante offre un modello di tatto che è allo stesso tempo forte e delicato. **"Biology has found a way to be able to do both of these things at once. And if we look at something like an elephant trunk there's so much complexity."** I ricercatori hanno sviluppato una "bacchetta con baffi" stampata in 3D per provare in prima persona come sente un elefante attraverso la sua proboscide.	**"How can an elephant completely, like, you know, eat a Christmas tree in two bites and then pick up something as delicate as a tortilla chip. This is one of the things that really started to fascinate a lot of roboticists. In a lot of the things that are human-made there are these trade-offs. If you have something that is really, really rigid, it might be very, very strong, but it's not delicate. And then if you have something that is really, really soft, it might be very delicate, but it's not very strong ."** The researchers have found elephant whiskers are similar to those of cats, which differ to the stiff sensory hairs of rats and mice. Elephant whiskers have stiff bases that gradually transition to soft a rubbery point, which allows them to brush past objects easily without breaking the whiskers. They can also forage and eat hundreds of kilograms of food each day, without damaging these precious hairs, which don't grow back if they're broken. Dr Schulz says the elephant's biology offers a model for touch that is simultaneously strong and delicate. **"Biology has found a way to be able to do both of these things at once. And if we look at something like an elephant trunk there's so much complexity."** The researchers have developed a 3D-printed 'whisker wand' to feel for themselves how an elephant feels through its trunk.

Il dottor Schulz spera che le loro scoperte aprano la strada allo sviluppo di sensori in grado di fornire informazioni più precise ai robot.	Dr Schulz hopes their findings will open the way to develop sensors that can give more precise information to robots.
"So I think a lot of the applications in robotics are looking at how can we combine some of the benefits of a soft interaction. So touching an object softly combined with having a rigid base which is going to keep a lot of the important information and like the vibrations from that interaction. And I think that has a really wide array of applications in robotics."	**"So I think a lot of the applications in robotics are looking at how can we combine some of the benefits of a soft interaction. So touching an object softly combined with having a rigid base which is going to keep a lot of the important information and like the vibrations from that interaction. And I think that has a really wide array of applications in robotics."**
Schulz ha anche dichiarato che l'analisi al microscopio dei baffi degli elefanti ha fornito informazioni preziose per la ricerca futura.	He says putting elephant whiskers under the microscope has offered invaluable information for future research.
"A lot of the science that we were able to talk about today really was using our sense of touch as a way to discover. And I think this is something that is not done a lot , and I hope that this work and some other work stemming from it can help us to explore some different structures using the sense of touch."	**"A lot of the science that we were able to talk about today really was using our sense of touch as a way to discover. And I think this is something that is not done a lot , and I hope that this work and some other work stemming from it can help us to explore some different structures using the sense of touch."**
Il dottor Brecht ha confessato che più scopre, più rimane stupito dalla sofisticatezza e dalla sensibilità del tatto degli elefanti.	Dr Brecht confesses the more he discovers, the more he marvels at the sophistication and sensitivity of the elephant's touch.
"And I believe that robotics can learn a lot from such powerful grasping organs. The trunk is not just any grasping organ; it is truly one of the best things nature has developed."	**"And I believe that robotics can learn a lot from such powerful grasping organs. The trunk is not just any grasping organ; it is truly one of the best things nature has developed."**

Report by Angelica Waite for SBS News.

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