Netnature: a bio-inspired speculative installation exploring novel forms of human-robot behaviors.

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Abstract

In recent years, scientific studies have increasingly focused on exploring the cognitive, relational, and interactive abilities of plants. Neurobiological research has revealed that plants are capable of engaging in interspecies communication and forming relationships with other organisms [1]. Additionally, they exhibit strategies influenced by swarm intelligence [2] and can establish nonverbal communication channels with humans [3]. This article introduces the speculative artwork called "netnature," a physical installation comprising six robotic flowers designed to respond to the physical and emotional resonance of the audience. The aim of netnature is to explore new forms of human-robot interaction inspired by the intelligence of plants, which often goes unnoticed by human perception, relying on nonverbal communication cues such as facial expressions and body movements. Similar to plants in nature, these flowers possess an artificial intellect that improves through interaction with people; the more visitors interact with the flowers, the more perceptible and recognizable their stem and bulb movements become. To generate this artificial empathic behavior, the six robot flowers employ internal cameras and pre-trained machine learning models in the fields of pose estimation and facial detection.

Fig. 1. The robotic flower are scattered randomly throughout the exhibition space. ©Ivan Iovine

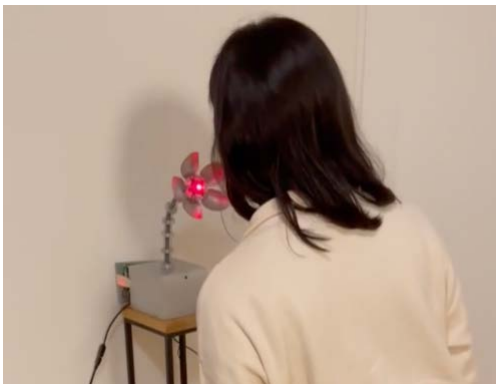Fig. 2. A robotic flower placed on the pedestal. ©Ivan Iovine

Fig. 3. Audience interacts with a robotic flower. ©Ivan Iovine

Notes

https://vimeo.com/543262974

https://www.dropbox.com/s/gm1esai8zp1n7sc/netnature_prototype.mp4?dl=0

References

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[2] Stefano Mancuso and Alessandra Viola, Brilliant Green: The Surprising History and Science of Plant Intelligence (Washing- ton, DC: Island Press, 2015), 128-130.

[3] Konrad Neuberger, "Non-verbal communication between people and plants - physical counter-transference and resonance as models for understanding people-plant interactions", 2012, Acta Hortic. 954, 83-85 DOI: 10.17660/ActaHortic.2012.954.9 https://doi.org/10.17660/ActaHortic.2012.954.9