

書報討論 #06_2

Exploring Art with a Voice Controlled Multimodal Guide for Blind People



NTHU iMS - 藝術與科技組

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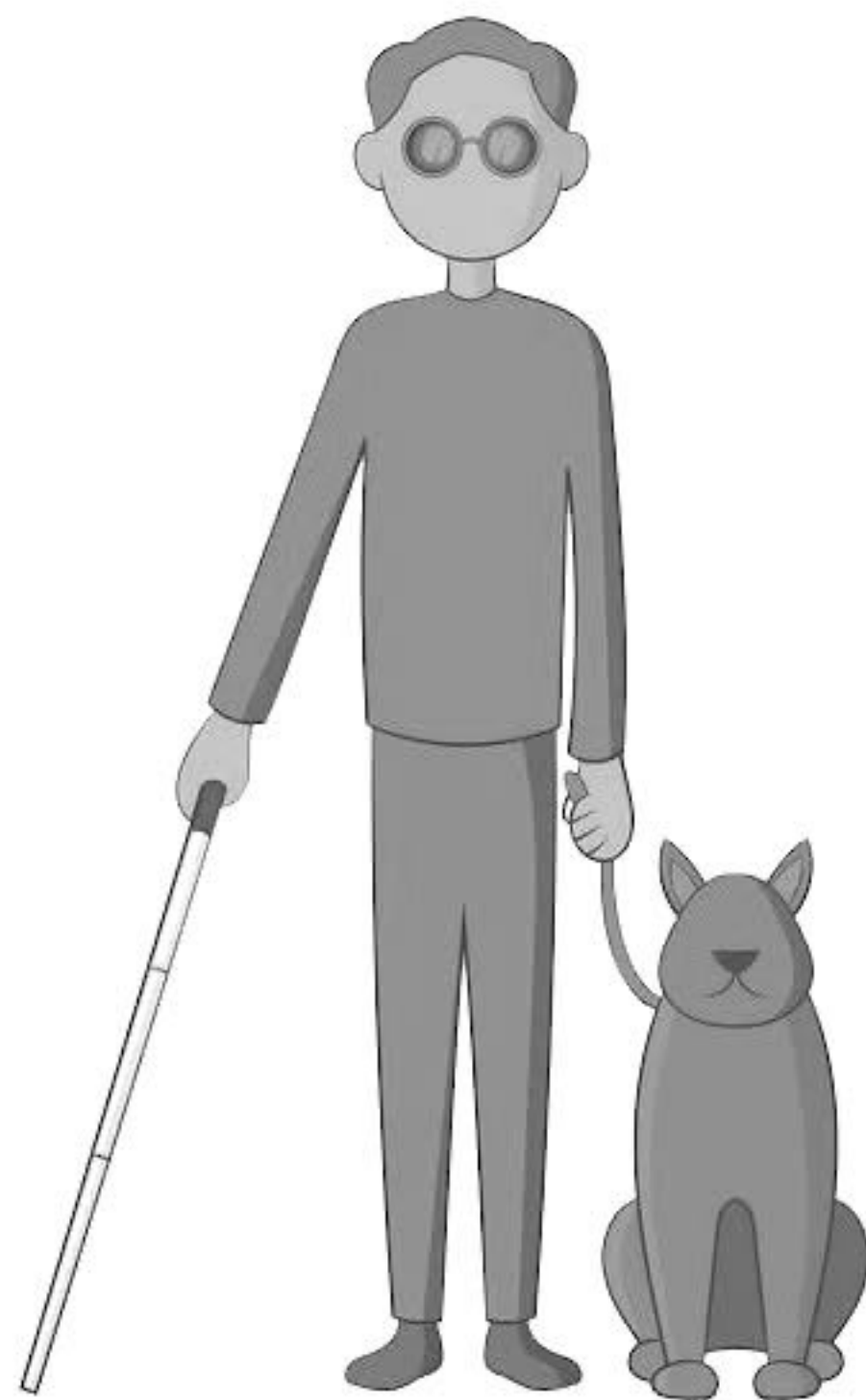
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这个社会对残障人士的关注与扶持是越来越高的。在过去的二十年里，残障人士辅助技术的研究数量一直在增长。但是，大部分的研究都集中在导航或网页浏览等方面。

而与艺术相关方面的问题，就比较少深入探讨的。特别是视力障碍者，因自身的缺陷，导致他们对视觉艺术品的欣赏是有很大的限制的。



所以作者的焦点，就放在了提高盲人对艺术品的可及性上面。



語音導覽



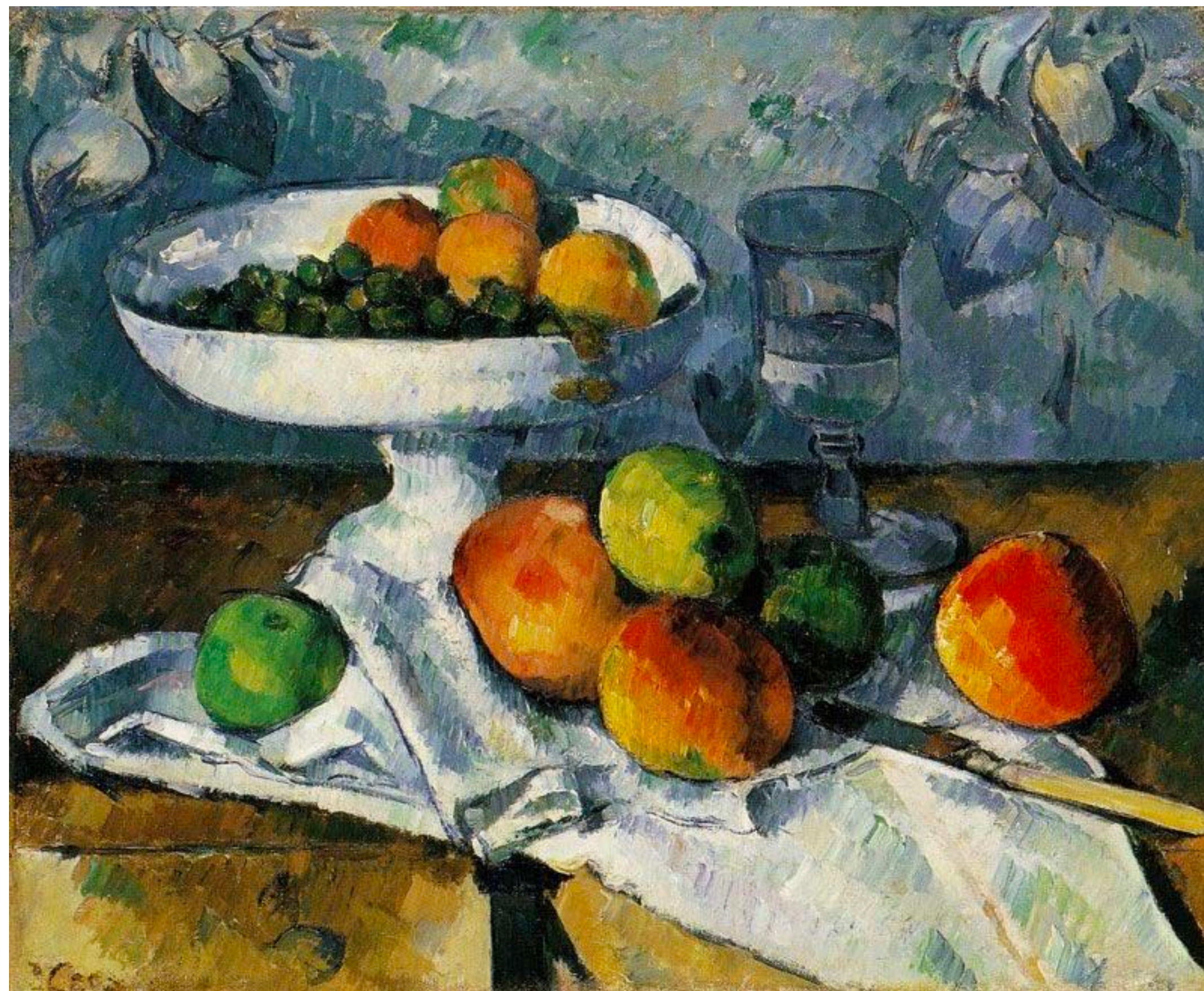
觸摸導覽

Art Engagement for the Blind

Pictures in your Mind presents a study of blind people interacting with art in which a depth camera is directed to a 2.5D relief model of an artwork to track the user's hands and provide localized audio descriptions based on the hand's gestures. Our multimodal guide also uses a 2.5D relief model, but instead uses conductive paint on the surface of the artwork to determine the location of the hand and can provide both localized and general audio descriptions triggered by a touch-voice control interface. Substituting complex hand gestures in favor of more common interactions, such as tapping or speaking, makes the system more comfortable to use.

Eyes-Free Art

Eyes-Free Art is based on a proxemic audio interface that tracks the distance between the user and the work of art. By getting closer to the artwork the users can sequentially access four different layers of audio information: background music, color related sonification, sound effect, and audio description. This information is accessed by moving one's hands in the air which are tracked by a Microsoft Kinect sensor . Our work is different in that our system provides freedom to the user in accessing the different layers of information by means of the touch and voice interfaces rather than by the distance between the user and the artwork. This allows the user to have their hands on the 2.5D representation model and explore it at all times while listening to the descriptions.



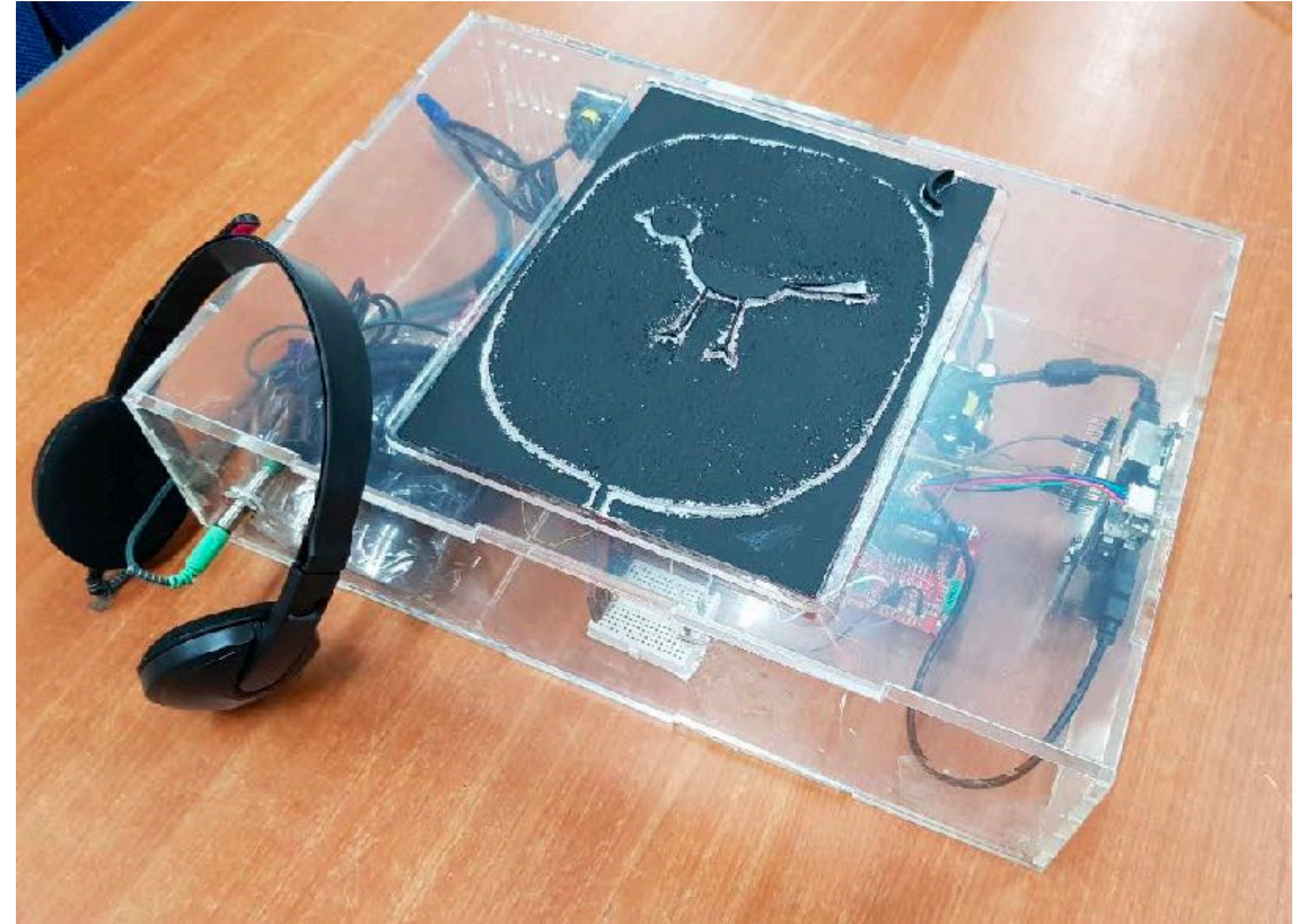
▲ Cézanne's Still Life. 其其中一件作品轉變成2.5D模型的原型



▲ 2.5D再現模型 塗有黑色導電漆的是交互區域



▲ 系統原型外觀呈現



▲ 系統原型外觀呈現

這個原型為盲人用戶提供了直觀、獨立地訪問他們感興趣的藝術品信息的界面。為此，作者開發了壹個雙觸摸語音用戶界面，該界面提供了兩層不同的音頻反饋，並分別映射到每個界面。這些信息層是：

- 具體信息:藝術品特定特征相關的信息，如物品名稱、顏色或含義。
- 壹般信息:關於藝術品的壹般信息，如作者、歷史背景、材料、尺寸、有趣的故事等，這些信息既不存在於視覺作品中，也不直接與可觸及的局部特征相關。

將具體信息映射到敲擊手勢，使用戶能夠直觀地將被觸摸的內容與被聽到的內容聯系起來。

觀者通過VUI來訪問作品的一般信息，能讓觀者在探索藝術品一般信息時獲得其他類型的功能，如背景音樂。

<p><u>"Painting"</u></p> <p><i>Long explanation setting the general context and information of the paint.</i></p>
<p><u>"Painter"</u></p> <p><i>Biography and information of the painter</i></p>
<p><u>"Music"</u></p> <p><i>Relaxing piano background music to accompany the artwork exploration.</i></p>
<p><u>"Options"</u></p> <p><i>List of all command words available.</i></p>
<p><u>"Instructions"</u></p> <p><i>The initial instructional audio is played again.</i></p>
<p><u>"Stop"</u></p> <p><i>Stopping an audio while it is playing.</i></p>
<p><u>"End"</u></p> <p><i>Getting out of voice mode and entering touch mode.</i></p>

User > "conversation"
System > "Which information would you like to hear? You can say 'painting', 'painter', 'music', 'instructions', or 'options'. For ending the conversation at any moment just say 'end'."
User > "painter"
System > "You can stop the audio at any moment by saying 'stop'. The painter's name is Vincent van Gogh. He..."
User > "stop"
System > "Is there any other thing you would like to know about?"
User > "options"
System > "Command word 'painting': I will explain to you general information related to the painting. Command word 'painter': the painter's biography will be heard. At any time the conversation can be ended by..." (audio finishes without the user stopping it earlier)
System > "Is there any other thing you would like to know about?"
User > "end"
System > "Remember you can start the conversation again by saying 'conversation'. Hope you enjoy the painting!"

作者也邀请了视觉障碍人士来对这个系统进行评测，他們都認為是一个很有前途的工具，能有效帮助视障人士访问和探索視覺艺术作品。

這個系統中的两种交互方式都被认为是直观且易于使用的，雙交互方式的概念对于访问具體信息和一般信息似乎是有效的。

用户也挺認同這個系統，并願意向他们的熟人推荐它。当问他们会把它推荐给谁时，大多数人回答说会推荐给视力有障碍的朋友，但也有一些人说他们希望有视力的朋友尝试一下，这样他们就能以一种不同的方式体验艺术。

1 - 沒有研發新技術，只是做了技術整合

2 - 資訊轉譯中是否會出現誤差

THANKS