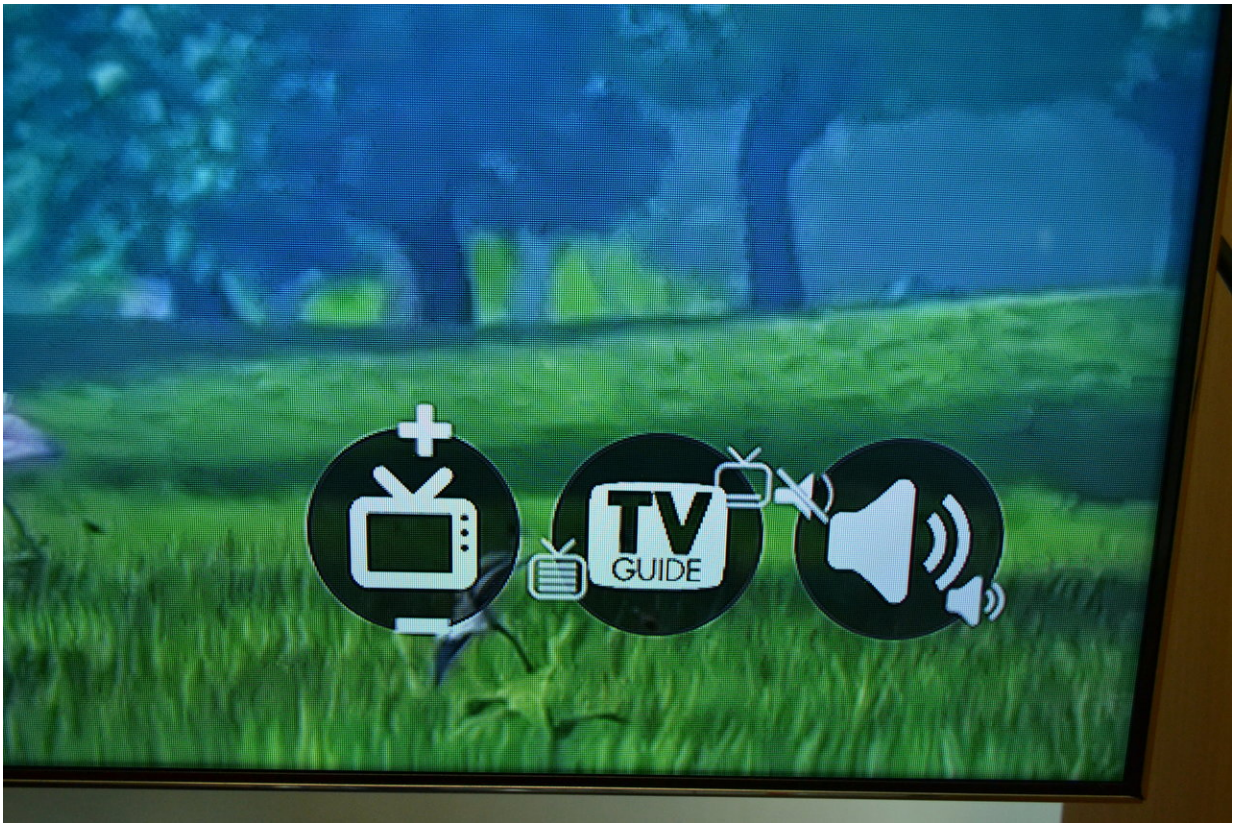


New gesture control tech turns any object into a TV remote

October 2 2017



Targets in the corner of a TV screen. Each target rotates around its corresponding function. The user matches the rotational movement with any object, or part of their body, to create a coupling and active the control. Credit: Lancaster University

Imagine changing the channel of your TV simply by moving your cup of

tea, adjusting the volume on a music player by rolling a toy car, or rotating a spatula to pause a cookery video on your tablet.

New gesture [control](#) technology that can turn everyday objects into remote controls could revolutionise how we interact with televisions, and other screens - ending frustrating searches for remotes that have slipped down the side of sofa cushions.

In a paper - 'Matchpoint: Spontaneous spatial coupling of [body movement](#) for touchless pointing' - which will be presented at the UIST2017 conference in Quebec City this October, researchers from Lancaster University show a novel technique that allows body movement, or movement of objects, to be used to interact with screens.

The 'Matchpoint' technology, which only requires a simple webcam, works by displaying moving targets that orbit a small circular widget in the corner of the screen. These targets correspond to different functions - such as volume, changing [channel](#) or viewing a menu. The user synchronises the direction of movement of the target, with their hand, head or an object, to achieve what researchers call 'spontaneous spatial coupling', which activates the desired function.

Unlike existing gesture control technology, the software does not look for a specific body part it has been trained to identify - such as a hand. Lancaster's technology looks for rotating movement so it doesn't require calibration, or the software to have prior knowledge of objects. This provides much more flexibility and ease for the user as it works even while hands are full, and while stood or slouching on the sofa.

Users also do not need to learn specific commands to activate different functions, as is the case with some gesture controlled televisions on the market, and the user is able to decouple at will.

When selecting volume adjustment or channel selection, sliders appear. The user moves their hand, head, or object, in the required direction indicated by the slider to change the volume or to find the desired channel.



Lancaster University researcher Christopher Clarke selects a channel to watch by using his mug as a remote control. He moves his drink left or right until finding the station he wants to watch. Credit: Lancaster University

As well as televisions, the technology can also be used with other screens. For example, YouTube tutorials, such as mending bikes or baking cakes, could be easily paused and rewind on tablet computers without users having to put down tools or mixing bowls.

Multiple pointers can be created to allow more than one user to point at drawings or pictures on interactive whiteboards simultaneously.

Matchpoint also allows users to manipulate images on whiteboards by using two hands to zoom in and out, and rotate images.

In addition to short-term couplings, users can also link stationary objects to controls, which even when left for prolonged periods will retain their control function. For example, a mug sat on a table could change a track on a [music player](#) when moved left or right, and a rolling toy car could be used to adjust volume. Objects can lose their coupling with controls simply by removing them from the camera's field of view.

Christopher Clarke, PhD student at Lancaster University's School of Computing and Communications, and developer of the technology, said: "Spontaneous spatial coupling is a new approach to gesture control that works by matching movement instead of asking the computer to recognise a specific [object](#).

"Our method allows for a much more user-friendly experience where you can change channels without having to put down your drink, or change your position, whether that is relaxing on the sofa or standing in the kitchen following a recipe.

"Everyday objects in the house can now easily become remote controls so there are no more frantic searches for remote controls when your favourite programme is about to start on another channel, and now everyone in the room has the 'remote'. You could even change the channel with your pet cat."

Researchers believe Matchpoint is also suitable to be used as an accessibility tool for people who are unable to use traditional pointers, such as remote controls and a mouse and keyboard.

More information: UIST 2017: 30th ACM User Interface Software and Technology Symposium, [DOI: 10.1145/3126594.3126626](https://doi.org/10.1145/3126594.3126626)

Provided by Lancaster University

Citation: New gesture control tech turns any object into a TV remote (2017, October 2) retrieved 31 May 2023 from <https://techxplore.com/news/2017-10-gesture-tech-tv-remote.html>

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