

A round-up of the eye related hot topics that have been trending on social media over the last few weeks.

#eyetrackingtechnology

#assistivetech #gaming

Modern eye trackers often rely on electronic specialist hardware that continuously scan the pupil and reflections from the cornea to infer gaze direction. A significant assistive application is for those with conditions such as cerebral palsy and motor neurone disease. Using their gaze, a user generates spoken output using text-to-speech software. Stephen Hawking relied on this technology for many years until his eyelids drooped, and cheek muscle tension was tracked instead.

The technology sees mainstream use in marketing, design and gaming. For online marketing it offers a better proxy for consumer intent than the computer mouse. Designing the visual displays of cars and aeroplanes has relied on eye-tracking for optimising ergonomics. Additionally, incorporation into cars can alert drivers if they become inattentive. Within gaming, specialist hardware can be prohibitively expensive. Swiss start-up, Eyeware Tech, have met this niche in the market head-on. Bespoke software linked with depth sensing technology present in many smartphones allows users of the Eyeware Beam app to control elements of their gaming experience with their gaze. The device placed next to a gaming screen uses dynamic facial assessment to infer gaze rather than corneal scanning. This elegantly cost-effective solution has the potential to significantly shake-up the eye-tracking technology market [1].

#cyberattack #eyeclinic #singapore

Eye & Retina Surgeons, a private eye clinic in Singapore, was stung by a ransomware attack. It tapped into the clinic's servers and management system, compromising the personal and clinical data of approximately 73,000 patients [2]. A root cause analysis is underway in conjunction with the Singaporean government and restoration of the clinic's IT system has been completed. The Singaporean Ministry of Health subsequently took the opportunity to state that none of its IT systems or the National Electronic Health Record had been compromised.

This fits into a trend of cyberattacks in Singapore, a 153% increase on the previous year. Many of these were carried out by the hacking group, 'ALTDOS' whose ransomware attacks have been wreaking havoc across Southeast Asia, with a

70% success rate in extracting payment from their victims. Singapore's Ministry of Health have now provided national cybersecurity guidelines for healthcare institutions [3].

#amblyopia #paediatrics #scanner

Amblyopia is the leading cause of preventable monocular vision loss in children. A US study supported by the National Eye Institute (NEI) recruited 300 children between the ages of two and six and tested a handheld screening device that aimed to detect amblyopia at an early and more treatable stage [4].

Eye teaming develops as the brain integrates images from both eyes. Misalignment or reduced acuity in one eye can affect this, leading the brain to favour one eye. The weaker eye loses uncorrectable visual acuity and school performance may be affected. Treatment involves dominant eye patching but becomes less effective with age. The device assesses fixation ability of the eyes while the child stares at a smiley face. It simultaneously scans both retinas and probes foveal nerve fibres with a polarised laser to create a binocularity score. All cases of amblyopia were correctly identified and as a more efficient diagnostic tool, this novel device could reduce unnecessary referrals [5].

#brain #organoid #tissueculture

Pioneering German scientists have grown miniature human brains with sets of eye-like structures containing retinal precursors called optic vesicles. Their findings may underpin deeper understanding of eye development and eye disease. The 3D brain organoids were grown from induced pluripotent stem cells (iPSCs) derived from adult human cell samples induced into a dedifferentiated embryonic state. The optic structures were light-sensitive and developed different retinal cell types connected to neuron tissue. Alongside co-development of primitive lens and corneal tissue, this demonstrated a high-fidelity human model. This may constitute an important step towards personalised medicine, as patient-specific retinal cell types may be generated for drug targeting and transplantation. Modelling of embryonic eye-brain interactions and congenital retinal disorders may also be possible [6].

#twitter #accessibility #contrast

Twitter's recent display design changes have raised the issue of social media accessibility. They received multiple complaints of eye strain and headaches when increasing visual contrast of buttons and its new font, 'Chirp'. Such universal changes do not accommodate individuals' preferences and highlights the need for more granular control of display elements by its users [7].

References

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