

NEWS

A roundup of the latest Everyday News from the world of electronics



Searching for a VR motion sickness cure – report by Barry Fox

As VR (virtual reality), along with AR (augmented reality) and MR (mixed reality) the new 3D – something that works as an event attraction, where people are prepared to wear something over their eyes, but not in the home where most of us don't want to wear anything to watch something?

And just like 3D, VR (along with AR and MR) quite literally makes some people feel sick. The VR industry knows this only too well because companies use the promise of not making people feel ill a USP – a 'unique selling point'. How many other products can you think of that sell with the message, 'ours doesn't make you feel quite so sick as theirs does'?

Patents galore

Recently, I did some research into VR sickness and found that over the last 25 years the US Patent Office has granted over 60 patents which directly refer to 'motion sickness' in the context of VR. The patents often admit that the exact causes are not yet fully understood and new patent applications on cures for the problem are still being filed, which suggests there is not yet any single magic-bullet fix.

Many filings were lodged by small specialist companies and individual inventors, but big name corporates and even the US Army feature among the filings.

The big names include Olympus, with filings dating from 1993, Walt Disney (1994), Raytheon and Hughes (1996), Mitsubishi and Intel (1997), Philips (1998), Eastman Kodak (from 2001 through to 2010), Massachusetts Institute of Technology (2007), Panasonic (2012), Microsoft (2013) and the US Army Research Laboratory (between 1997 and 2013).

Plenty of symptoms...

Kodak's US patent 8594381 helpfully defines motion sickness as 'the general term describing a group of common symptoms such as nausea, vomiting, dizziness, vertigo, disorientation, sweating, fatigue, ataxia, fullness of stomach, pallor'.



VR systems are widely used for applications as diverse as gaming, health and safety training and entertaining EPE columnist Clive 'Max' Maxfield, a keen exponent of VR (and interesting shirts). However, a persistent problem is users experiencing motion sickness.

'Although sea-, car-, and airsickness are the most commonly experienced examples' the patent says, 'these symptoms were discovered in other situations such as watching movies, video, in flight simulators, or in space (and) motion sickness is a significant obstacle for users of immersive and virtual reality systems and head-mounted displays, limiting their widespread adoption despite their advantages in a range of applications in gaming and entertainment, military, education, medical therapy and augmented reality... motion-sickness

symptoms are known to occur in users wearing head-mounted displays during head or body motion, as well as when watching content or playing computer games for a relatively prolonged period even without head or body motion.'

Two of Disney's patents (US 6007338 and 5551920) deal with simulators, as do several from the US Army (6050822, 8988524 and 9434309). US patent 5991085, a 1995 filing from i-O Systems of Menlo Park, discusses the use of head-mounted displays 'to provide an image-only or 'immersive' device' and suggests that the wearer be given 'the option of achieving a view of the environment... to avoid a motion-sickness-like feeling.'

US patent 5579026, filed by Olympus Optical in 1993, describes a head-mounted display and admits the risk of 'a bad feeling just like motion-sickness.'

Raytheon's US patent 5829446 confirms that even in 1996, when the patent was filed, 'cybersickness has become substantially more prevalent as people use high fidelity simulators to travel through computer-generated environments' and warns of 'cybersickness flashback, the sudden onset of simulator sickness symptoms in a simulator user who is no longer in a simulation environment.'

...but few 'cures'

'Numerous universities, consulting firms, technology companies and entertainment companies have vigorously investigated and attempted to reduce simulator sickness' Raytheon wrote in 1996. 'Methods for reducing simulator sickness have included increasing video update rates, adding motion bases to provide physical sensations to coincide with the video image, adding or improving sound

Searching for a VR motion sickness cure – continued

systems, improving video fidelity, introducing distracting objects to scenarios, providing depth through use of lenticular displays, slice stacking, binocular displays, repeated or prolonged exposure to induce physiological or psychological adjustment, and medication.'

Raytheon adds: 'The numerous prior investigations have yet to develop complete solutions for elimination of simulator sickness, but a number of studies have addressed specific ill effects with specific solutions and have identified previously unknown varieties of simulator sickness.'

One of the more recently published applications was filed by Sony. 2016/0246057, with the in-explicit title 'Image Display Device and Image Display Method, Image Output Device and Image Output Method, and Image Display System'. It says: 'Head-mounted displays are extremely popular (and) if mass production advances further in the future, head-mounted displays may become as common as mobile phones, smartphones, or handheld game consoles, and everyone may come to own their own head-mounted display.'

'The causes of VR sickness are various' the patent further explains, '... when an image with a wide range

provided by an image output device is viewed over a narrow field on the side of the image display device, or when an image with a narrow range provided by an image output device is viewed over a wide field on the side of the image display device, distortion remains and readily induces VR sickness.'

Sony's aim is 'reducing VR sickness... (by) correcting the mismatch between the field of view of the provided image and the field of view experienced by the viewer.'

Each user personalises their head-mount viewer, with the result stored in standard format EDID (extended display identification data). The head mount then automatically tailors all VR images it displays. When the field of view of the VR image is too large the device cuts out and displays only a central region; when the VR field of view is smaller, the display adds black margins or wallpaper to fill the edge gaps, or stretches the images to fit. Either way the field of view of the VR images matches the user's field of view.

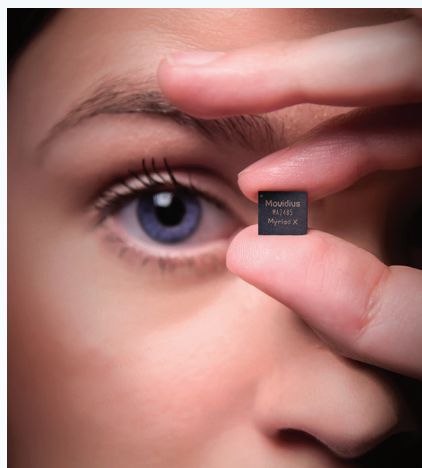
As a result, 'it is possible to greatly reduce VR sickness in the user (and) it is possible to display images from the first-person view or images with a wide field of view while reducing VR sickness.'

Intel unveils neural compute engine to unleash AI

Intel has introduced its new Movidius Myriad X vision processing unit (VPU), advancing its portfolio of artificial intelligence (AI) IC solutions to deliver more autonomous capabilities across a wide range of product categories, including drones, robotics, smart cameras and virtual reality.

Myriad X is the world's first commercially available system-on-chip (SOC) with a dedicated neural compute engine for accelerating deep learning inferences. The engine is an on-chip hardware block specifically designed to run deep neural networks at high speed and low power without compromising accuracy, enabling devices to see, understand and respond to their environments in real time. It enables Myriad X architecture to have 1 TOPS (trillion operations per second) of compute performance on deep neural network inferences.

'We're on the cusp of computer vision and deep learning becoming standard requirements for the billions of devices surrounding us



every day,' said Remi El-Ouazzane, vice president and general manager of Movidius, Intel New Technology Group. 'Enabling devices with humanlike visual intelligence represents the next leap forward in computing. With Myriad X, we are redefining what a VPU means when it comes to delivering as much AI and vision compute power possible, all within the unique energy and thermal constraints of modern untethered devices.'

UK offshore wind prices tumble



Whatever your preferred flavour of electronics, from PIC projects to valve power amplifiers, you are dependent on a reliable source of electricity. We are spoilt for choice when it comes to how to generate electrical power, but an increasingly important source of 'fuel' is the wind. The UK has 45% of the best available wind energy resource in Europe and over the next four years an estimated £17.5bn will be invested in UK wind energy infrastructure.

On top of this funding, the wind energy industry got a vital boost in September. RenewableUK, the UK's offshore wind energy trade association reported a dramatic fall in the cost of electricity generated offshore following the results of the most-recent auctions for new contracts to provide nearly 4GW of clean electricity, enough power for 3.3 million homes.

The cost of offshore wind electricity has plummeted since the last competitive auction results were announced in February 2015, with the new prices on average 47% lower than they were just over two and half years ago. The prices – some as low as £57.50/MWhr – are cheaper than the cost of the 35-year contracts for new nuclear power of £92.50/MWhr, and cheaper than the levelised cost of gas, according to figures from the Department of Business, Energy and Industrial Strategy.

Pi cubed

True, it isn't the first, or the fastest Rubik's cube solver, but the machine demonstrated and explained at <http://bit.ly/2xI2s7L> has a real elegance that is well worth watching. Plus, it is driven using a Raspberry Pi 3 via a Compute Module Development Kit, which just goes to show that the Pi is not just for slow, simple processing, but is capable of some pretty sophisticated multitasking – in this case, driving multiple motors and running the solution algorithm in real time.

And for those of you who like to mix a little Meccano with your electronics, this version will inspire you: <https://youtu.be/C9rCBjLGxJs>