MIT Technology Review Subscribe

MIT Technology Review Subscribe

UNCATEGORIZED

Hack: The Nintendo Wii

Technology Review looks at the inner workings of the Nintendo Wii game console.

By Daniel Turner

July 1, 2007

Initially discounted by game-industry watchers as graphically underpowered compared with the Sony PlayStation 3 and Microsoft Xbox 360, the Nintendo Wii has wiped the sales floor with its competitors. In February 2007, 335,000 Wiis were sold in the U.S., versus 228,000 Xbox 360s and 127,000 PS3s. Behind the Wii's success is its unique controller: simple and wireless, it responds to your movements in a natural manner, turning into a baseball bat, a sword, or a hand, as necessary. It is, in a word, fun.

MEMS Sensor 1 (Wii Remote)

The key to the Wii's main controller is its three-axis microelectromechanical-system (MEMS) accelerometers, which measure movement in three dimensions. Two-dimensional MEMS sensors

Exhibit 1043 page 1 of 8
DENTAL IMAGING

manager at Analog Devices, which makes the sensor used in the Wii Remote. Most MEMS sensors come in hermetic packages made from ceramics or metals. But this increases the devices' size and cost–a problem that the additional sensory dimension was only going to aggravate. "What we do," says Lemaire, "is put a cap over the sensor elements at the wafer level." That creates a hermetic cavity and enables the use of a cheap, small, lightweight case.

Advertisement

– Flash Movie. Do not edit.–

Bluetooth

The Wii Remote uses a Broadcom Bluetooth chip to wirelessly send a constant stream of position, acceleration, and button-state data to the Wii console. The chip also contains a microprocessor and RAM/ROM memory for managing the Bluetooth interface and converting voltage data from the accelerometers into digitized data.

THE DOWNLOAD

Sign up for your daily dose of what's up in emerging technology.

Enter your email

Sign up

By signing up, you agree to our Privacy Policy.

Multimedia

View a hack of the Wii.

Exhibit 1043 page 2 of 8
DENTAL IMAGING

into the Wii Remote. It features an analog joystick and two buttons, but it also has its own MEMS accelerometer, this one provided by STMicroelectronics. Benedetto Vigna, an STMicroelectronics physicist, says that the company's three-dimensional accelerometer had a "really quick" development time; the company first met with Nintendo about the Wii in March 2005, only nine months before the product shipped. Vigna notes that there are two chips inside the 5-millimeter-by-5-millimeter-by-1.5-millimeter plastic package–the accelerometer and another chip that translates the tiny wiggles of the sensor into voltage. As in the Wii Remote, the voltage readings are then translated into motion data by a microprocessor, and the data are transmitted wirelessly from the Wii Remote via Bluetooth to the Wii console.

Infrared Sensor Bar

The accelerometers in the controls gauge movement but not position relative to the TV screen. So the Wii comes with a "sensor bar," to be placed at the top or bottom of the screen. The bar sends out an infrared signal, which is picked up by detectors at the front of the Wii Remote. The Remote uses distance and angle information to triangulate its location, which it sends, along with acceleration data, to the console.

Wi-Fi

Nintendo saw the value of adding Wi-Fi wireless connectivity to its popular DS handheld gaming device, which allowed users to play against others wirelessly, so it did the same with the Wii. If you have an Internet connection, you can use the Wii to surf the Web or access information hosted on Nintendo's servers, such as weather and news. Developers have said there will be Wii games that offer online play, though as of this writing only one–a Pokémon title–has been released.

by Daniel Turner

MAGAZINE

Second Earth

This story was part of our July/Aug

Explore the issue →

Exhibit 1043 page 3 of 8
DENTAL IMAGING

MIT Technology Review

Subscribe

Continue reading more stories

Subscribe now for unlimited access.

Subscribe

DEEP DIVE

UNCATEGORIZED

Identity protection is key to metaverse innovation

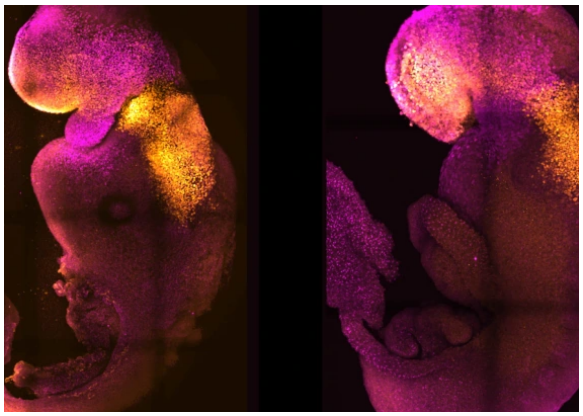
As immersive experiences in the metaverse become more sophisticated, so does the threat landscape.

By MIT Technology Review Insights

Embracing CX in the metaverse

More than just meeting customers where they are, the metaverse offers opportunities to transform customer experience.

By MIT Technology Review Insights



Scientists have created synthetic mouse embryos with developed brains

The stem-cell-derived embryos could shed new light on the earliest stages of human pregnancy.

By Rhiannon Williams

Exhibit 1043 page 5 of 8
DENTAL IMAGING

Modern security demands an empathy-first approach to insiders

While attention is often focused on threats from outside the organization, employees too can pose a risk to security—even inadvertently.

By Code42

STAY CONNECTED

Get the latest up
MIT Technolog

Discover special offers, top stories, upcoming events, and more.

Privacy Policy

Our in-depth reporting reveals what's going on now to prepare you for what's coming next.

Subscribe to support our journalism.

Exhibit 1043 page 7 of 8
DENTAL IMAGING

Back to top