



How data gloves are helping industry

It's almost impossible to imagine everyday life without virtual reality. VR glasses are taking computer gaming to a new level and enable journeys to unknown worlds. In industry, however, the next leap forward is coming from data gloves instead.

 expertise4innovations

© Wolfram Scholl

The real and virtual worlds are increasingly merging into one – this applies to our leisure time as much as it does to industry. When we talk about [Virtual Reality](#), or VR, it is mostly in terms of applications in the games and entertainment industry. VR glasses, sometimes referred to as headsets, are the ticket to computer-generated 3D worlds. These could be games, but it is equally possible to “travel” to popular destinations or undertake virtual tours of properties on the market thanks to realistic 360-degree projections. The technology that this requires has an established market presence – major players such as [Samsung](#), [Sony](#) or [Microsoft](#) offer affordable VR glasses in their product ranges. In parallel, [Augmented Reality](#) has established itself, providing an additional layer of reality on top of the real world, using digital technology to add to it. We have already covered the possibilities afforded by VR and AR for the manufacturing industry [in our blog](#).

Data gloves have been around since 1983

At least as important as VR glasses are input devices that only start to make sense due to the user's actions in the virtual world. In the gaming world, many manufacturers rely on classic controllers that are equipped with motion sensors. From the perspective of the industrial sector, however, many see the greatest promise in an invention that first saw the light of day as far back as 1983 – and some [sources](#) even suggest 1977: the data glove. This not only allows actions in virtual (gaming) worlds; it's also suited for use in industrial manufacturing. The user puts on the glove, then sensors detect movement and transmit it to the computer. “Hand and finger movements orient the hand in the virtual space. The glove is mostly used in combination with a headset. As well as navigation and orientation in virtual space, gloves also provide tactile force feedback,” explain the [Wikipedia](#) authors.

Early attempts to explore virtual reality were made by [NASA](#), while Nintendo launched its “[Power Glove](#)”, which recognised 256 different hand positions in 1989, in the first attempt to use the data glove concept for video games.



Nintendo Power Glove for the 1983 Nintendo Entertainment System (NES)

Development of data gloves continues today. Recently, a Californian company, [BeBop Sensors](#), presented the [Forte Data Glove](#). The glove features ten sensors and is designed for a broad range of personal and commercial applications, giving users haptic feedback, while the glove connects to computers via Bluetooth or USB for a fifteen-hour battery life.

Virtual reality and data gloves support the automotive industry

In industry, the aim is to simplify processes to improve productivity. VW Group’s Czech subsidiary, Škoda, has been using data gloves in [vehicle production](#) since 2016. ProGlove is the name of a product by a [Munich-based manufacturer](#) that is designed to help the car manufacturer progress in the [Industry v4.0](#) environment, towards intelligent, networked production via the Internet of Things or IOT. The glove recognises whether the worker is holding the right product in his or her hand, and whether the worker is performing the tasks in line with the process requirements. The scanning stage is no longer required; instead, a natural hand movement combines multiple steps in the process. Another VW subsidiary is taking a different approach towards the benefits of virtual reality: [Audi is simulating the assembly of virtual models in its CAVE](#) long before they are released to the market. The acronym, CAVE, stands for Cave Automatic Virtual Environment and refers to the 3D projected space used to visualise the environment.

Data gloves and virtual worlds also benefit the aviation industry

Lufthansa Technik Logistik Services also relies on the data glove. This Lufthansa subsidiary uses the Internet of Things to configure its business processes more efficiently and to reduce its employees' workload. This includes a pilot programme at Munich Airport for the firm's warehousing activities, in the context of the business's digitalisation strategy. The location was particularly suitable for the pilot due to its location and the choice of the airport as a base for new aircraft types, such as the Airbus A350. "Digital assistance systems, geolocation technologies and driverless transportation systems are currently being trialled and introduced in selected areas of activity. We are specifically working with startup companies to introduce solutions such as the ProGlove smart data glove and an autonomous warehouse truck by Agilox," said Dr Harald Kolbe, Head of Digital Innovation at LTLS. There are plans to implement digitalisation at other locations in the future.



The ProGlove recognises whether the user is holding the right component or product - Source: ProGlove

The European aviation conglomerate, Airbus, also takes advantage of the benefits offered by data

gloves. At its location in Ottobrunn, our photographer, Wolfram Schroll, managed to take the photo for our May calendar page at Airbus's location in Ottobrunn. In [Hamburg, the aircraft manufacturer operates a giant, virtual world](#), with sixteen projectors and all kinds of technology enabling entire aircraft cabins to be simulated.

Robots learn by using data gloves at Siemens

Data gloves are also highly useful in other fields of industry, for instance in the manufacture of tooling and machines, when robots need to learn from humans. [Siemens is developing adaptable robots](#) that fit in to the concept of Industry v4.0, with a research team in China leading the way within the framework of a project delivered by Siemens Corporate Technology, known as "Autonomous Systems Revolution." The aim of the project is to create robots that support humans in their work, with researchers developing a data glove that can record the movement of human hands, thereby enabling it to convey complex commands to robots in turn. Data gloves like these could also record people's grip movements, making it possible to train new employees.

Source: [Airbus](#) | [Audi](#) | [Bebop](#) | [forbes](#) | [Microsoft](#) | [NASA](#) | [ProGlove](#) | [Samsung](#) | [Siemens](#) | [Sony](#) | [Lufthansa Technik](#)



Patrick Holland-Moritz

Freelance journalist and photographer

Patrick Holland-Moritz is himself an active pilot and spent thirteen years as aviation editor of the *Aerokurier* journal. He later worked as a freelance journalist and has supported a range of businesses with their communications needs. He has now returned to work for Motor Presse Stuttgart as a journalist and editor.