

# Strapped In: Deep Research on the Most Important Launches and Breakthroughs in Wearable Tech from the Past 7 Days (27 Nov – 3 Dec 2025)

## Introduction

The past week has been one of the most active periods in recent memory for wearable technology. Major companies and research institutions unveiled products and prototypes that further blur the line between human and computer—a theme we call “**Strapped In**”. Human-computer integration is no longer limited to fitness trackers; new devices are beginning to read biosignals, augment our senses, and even control other machines. This report surveys launches, research breakthroughs, applications, challenges and near-term outlooks from 27 November to 3 December 2025. Only announcements and studies verified by credible sources (official press releases, peer-reviewed papers and reputable outlets) are included.

## Key Launches

### AR & AI-integrated smart glasses

Product/Announcement	Highlights	Evidence
Li Auto Livis smart glasses	Chinese automaker Li Auto unveiled <b>Livis</b> AI smart glasses on 3 December. The glasses weigh <b>36 g</b> and feature photo/video capture, voice interaction, and the ability to <b>control Li Auto vehicles</b> (open windows, adjust climate and check battery status). A <b>12 MP Sony sensor</b> records photos and videos, and a <b>36 mm × 36 mm × 12 mm housing</b> holds the electronics. Battery life is <b>~18.8 hours</b> , and the glasses are priced at <b>RMB 1,999 (≈US \$283)</b> . Livis integrates Li Auto’s Mind GPT voice assistant and includes a mode for children 【113392561205733†L31-L107】 .	CnEVPost reports that Li Auto positioned Livis as a showcase of its AI capabilities and notes that other Chinese tech firms are also racing to launch smart glasses 【113392561205733†L31-L107】 .
Alibaba Quark AI Glasses	On 27 <b>November</b> Alibaba	The official Alizila article

## Product/Announcement

### Highlights

announced two **Quark AI Glasses** models. The flagship **S1** uses dual **micro-OLED displays** and two chips, supports bone-conduction voice pickup and features a **swappable dual-battery system** enabling up to **24-hours of runtime**. The camera-centric **G1** forgoes displays and emphasises imaging; both integrate Alibaba's **Qwen large language model** through the Qwen app for real-time translation, price recognition, voice-based search and AI assistance

【40685185148220†L144-L160】 . Prices start at **¥3,799** for the S1 and **¥1,899** for the G1 【40685185148220†L144-L160】 .

## Lighthouse Tech TAMI® mobility-assistance eyewear

Swiss start-up Lighthouse Tech received **CHF 1.2 million** from the Swiss innovation agency **Innosuisse** on 2 December to develop **next-generation smart eyewear for people who are blind or visually impaired**. Working with **ETH Zurich** and **CSEM**, the project will advance embedded AI for real-time obstacle detection and enable lightweight glasses that provide **haptic feedback** through the TAMI® platform

【310384296058478†L19-L37】 . The company simultaneously launched an equity crowd-funding round to

### Evidence

explains that Quark glasses integrate deeply with Alibaba's AI ecosystem and emphasises human-machine interaction through voice and touch

【40685185148220†L144-L160】 .

Globe Newswire quotes Lighthouse Tech's executives saying the grant will allow them to integrate advanced mobility-assistance functions into everyday eyewear and expand the product across Europe

【310384296058478†L19-L37】 .

Product/Announcement	Highlights	Evidence
<b>Vitalist / MicroEJ Reebok smartwatch with VitalOS</b>	<p>scale production 【310384296058478†L39-L50】 .</p> <p>Vitalist Inc. and MicroEJ announced a <b>Reebok-branded smartwatch</b> on 2 December. It runs <b>VitalOS</b>, a virtualised operating system built on MicroEJ’s VEE Wear platform and used in over 400 million devices. The platform allows <b>battery-efficient, hardware-agnostic</b> wearables and reduces product development cycles to <b>6–9 months</b>. The companies emphasise that VitalOS supports <b>white-label customisation</b> so brands can create unique experiences instead of relying on proprietary ecosystems 【619809660053963†L13-L67】 .</p>	<p>The press release notes that the Reebok smartwatch is the first commercial implementation and will debut at CES 2026 【619809660053963†L13-L67】 .</p>
<b>Nordic Semiconductor nRF54LV10A low-voltage SoC</b>	<p>On 2 December Nordic Semiconductor introduced the <b>nRF54LV10A</b> system-on-chip for ultra-compact healthcare wearables. Measuring <b>1.9 × 2.3 mm</b>, it operates at <b>1.2 V</b>, enabling devices such as continuous glucose monitors and biosensors to be powered directly by a coin cell. The chip integrates an <b>Arm Cortex-M33 core</b>, a <b>RISC-V co-processor</b>, secure boot and firmware update with tamper sensors, and supports <b>Bluetooth Channel Sounding</b> for centimetre-accurate positioning</p>	<p>Nordic’s news release emphasizes that the SoC combines low-voltage operation with advanced security and positioning features, enabling new classes of wearables 【797092402832830†L21-L106】 .</p>

Product/Announcement	Highlights	Evidence
Taoglas LTCC chip antennas	<p data-bbox="607 226 1013 310">【797092402832830†L21-L106】 .</p> <p data-bbox="607 315 1013 1163">RF specialist Taoglas announced on 2 December a range of <b>low-temperature co-fired ceramic (LTCC) chip antennas</b> targeting wearables. Three models deliver high efficiency in tiny footprints: the <b>ILA.257</b> (3.2×1.6×0.5 mm) supports <b>Wi-Fi 6/7</b> across 2.4–7.125 GHz; the <b>ILA.68</b> (3.2×1.6×1.1 mm) provides <b>UWB</b> connectivity for precision positioning; and the <b>ILA.89</b> (4.0×12.0×1.6 mm) supports <b>868/915 MHz ISM</b> bands for LPWAN/LoRa. Taoglas highlights that these antennas minimize keep-out area and are designed for <b>ultra-compact wearables and IoT modules</b> 【811796135652036†L66-L112】 .</p>	<p data-bbox="1019 315 1437 651">Embedded Computing Design notes that the antennas’ small size and high radiation efficiency simplify integration into battery-powered wearables and help designers meet shrinking device footprints 【811796135652036†L66-L112】 .</p>

## Neural and haptic interfaces

While no major commercial brain-computer interfaces were released this week, some organisations are preparing for human-computer integration through neural and haptic technologies:

- **Regulatory spotlight on neural-enabled wearables:** Reuters reported that the U.S. Food and Drug Administration (FDA) is tightening oversight of health features in wearables. The agency has warned companies such as **WHOOP**, whose blood-pressure insights feature may qualify as a medical device. Apple is seeking FDA clearance for a hypertension notification feature, while WHOOP contends that its insights are for wellness only. Experts caution that compliance will require **clinical and cybersecurity testing, quality-system documentation, and possibly hardware redesigns** 【618631135284159†L43-L116】 . Greater scrutiny may influence how quickly neural-interface devices reach market.
- **Liquid-metal haptic fibres for textiles:** A Nature Electronics study demonstrates a

**thermal-drawing method** to embed **liquid metal droplets** inside elastic fibres. The resulting fibre exhibits high conductivity ( $\sim 10^3$  S cm<sup>-1</sup>), a dielectric constant of  $\sim 13.5$  and can stretch **over 900 %** with little hysteresis. Researchers integrated the fibres into a knee brace that senses joint movement with a **gauge factor of 0.96** and high stability **【418035182168219†L126-L142】** , hinting at comfortable textile-based haptic sensors.

## **Breakthrough Research**

### **Advanced materials and biosignal sensing**

- **Liquid-metal-embedded elastomer fibres** – Researchers from MIT and partners developed a **scalable thermal drawing process** to create stretchable fibres by dispersing liquid-metal droplets within an elastomer. These fibres exhibit high conductivity and elastic stretchability and operate as **capacitive strain sensors** with near-linear response and durability over thousands of cycles **【418035182168219†L126-L142】** . The demonstration of a smart knee brace highlights potential applications in wearable haptics and prosthetics.
- **AI-enabled sweat biosensing** – A review led by the University of Technology Sydney synthesised recent progress in microfluidics and AI for **sweat-reading wearables**. Sweat contains hormones, metabolites and medication residues, and modern microfluidic patches can collect and analyse these biomarkers continuously. When coupled with AI algorithms, such devices may detect diseases like diabetes, cancer and neurodegenerative disorders **before symptoms appear** **【91071463794559†L48-L82】** . The study notes that modern AI can interpret subtle chemical patterns and that the next breakthrough will be compact, low-power devices capable of secure wireless transmission **【91071463794559†L94-L107】** .

### **Signal processing and edge computing**

- **Hybrid modeling of photoplethysmography (PPG)** – An interdisciplinary team proposed a **hybrid machine-learning pipeline** to estimate cardiovascular parameters from PPG signals. The approach combines a **conditional variational autoencoder** trained on clinical PPG and arterial pressure waveforms with a **density estimator** trained on hemodynamic simulations. When tested on clinical data, the model **outperformed supervised baselines** in tracking cardiac output and stroke volume and captured short-term fluctuations **【60989950899361†L16-L26】** . This research suggests that future wearables may derive hemodynamic biomarkers from simple optical sensors.
- **Audio-augmented mindfulness device** – Stanford’s SHAPE Lab and Virtual Human Interaction Lab unveiled an **audio-augmented wearable** on 3 December. The device uses **two wrist-strapped microphones** to amplify sounds from everyday hand interactions and plays them through earbuds. In a lab study with 60 participants, those receiving the audio augmentation **reported higher mindfulness**, spent more time

exploring objects and exhibited more exploratory behaviours compared with the control group **【918736866745181†L168-L203】** . Researchers believe the device could aid people with **anxiety or ADHD** by encouraging present-moment awareness **【918736866745181†L214-L221】** .

## Wireless communication and miniaturisation

- **Low-voltage Bluetooth LE SoC** – Nordic’s **nRF54LV10A** demonstrates how lowering operating voltage to **1.2 V** can dramatically reduce power consumption and enable wearables to run on **single coin cells** **【797092402832830†L21-L106】** . The SoC’s built-in **Bluetooth Channel Sounding** supports centimeter-level positioning, an emerging requirement for medical and industrial wearables. Its on-chip Arm TrustZone, tamper sensors and secure boot/firmware update create a secure edge-computing environment for biosignal processing.
- **LTCC chip antennas for Wi-Fi 6/7, UWB and LPWAN** – Taoglas’ new antenna range provides high radiation efficiency and small footprints. The tri-band **ILA.257** covers the **2.4 GHz, 5.8 GHz and 7.125 GHz bands**, the **ILA.68** supports **UWB** across 6–8.5 GHz and the **ILA.89** covers **868 MHz and 915 MHz bands**. Their ultra-compact sizes (down to **3.2 × 1.6 × 0.5 mm**) and pick-and-place packaging simplify integration into wearables, enabling more sensors to coexist in the same device **【811796135652036†L66-L112】** .

## Applications

### Medical and health care

- **Cardiovascular monitoring** – Hybrid PPG modeling could enable smartwatches or patches to estimate **stroke volume and cardiac output** without invasive measurement **【60989950899361†L16-L26】** . Combined with Nordic’s low-power SoC, devices may monitor hemodynamics continuously while maintaining long battery life.
- **Diabetes, stress and medication tracking** – Sweat-reading patches are poised to provide real-time information on **glucose, cortisol and drug levels** without blood draws **【91071463794559†L48-L82】** . This could transform chronic-disease management and preventive medicine.
- **Mobility assistance for the visually impaired** – Lighthouse Tech’s TAMI® eyewear combines embedded AI and haptic feedback to help blind users navigate obstacles **【310384296058478†L19-L37】** . Innosuisse funding suggests this assistive technology will soon move from prototype to commercial product.
- **Mindfulness and mental health** – Stanford’s audio-augmented device demonstrates that simple sensory amplification can improve **mindful attention** and may benefit people with **ADHD or anxiety disorders** **【918736866745181†L168-L221】** .

## Industrial, productivity and lifestyle

- **Vehicle-linked glasses** – Li Auto’s Livis glasses integrate with the company’s vehicles, enabling drivers or passengers to control windows, climate and check battery status through voice commands 【113392561205733†L31-L107】 . This marks a new class of wearable as a **remote cockpit** for other devices.
- **AR-assisted communication and translation** – Alibaba’s Quark glasses offer real-time translation, price recognition, meeting-note summarisation and navigation using the Qwen AI model 【40685185148220†L144-L160】 , boosting productivity in retail, travel and business settings.
- **Sports and entertainment** – Reebok’s smartwatch built on VitalOS aims to provide branded experiences and long battery life 【619809660053963†L13-L67】 . Liquid-metal fibres could lead to **haptic garments** for gaming or rehabilitation 【418035182168219†L126-L142】 .

## Challenges

1. **Regulatory uncertainty** – The FDA’s scrutiny of wellness features underscores the **blurred boundary between consumer wearables and medical devices**. Companies face costly clinical validation and cybersecurity requirements 【618631135284159†L43-L116】 . Regulatory delays may slow adoption of neural-interface and health-monitoring wearables.
2. **Data privacy and security** – Sweat-reading and PPG-based devices generate sensitive health data. Ensuring secure, on-device processing—through features like **Arm TrustZone** in Nordic’s SoC 【797092402832830†L21-L106】 —will be essential to protect users.
3. **User comfort and form factor** – For wearables to become ubiquitous, they must remain **lightweight, unobtrusive and comfortable**. Liquid-metal fibres show promise for soft, stretchable sensors 【418035182168219†L126-L142】 , but integrating batteries, antennas and processors in tiny packages remains difficult. Taoglas’ small antennas 【811796135652036†L66-L112】 and low-voltage chips 【797092402832830†L21-L106】 help, yet long-term comfort tests are needed.
4. **Battery life vs. processing power** – AI-driven biosignal analysis requires computational resources. Designers must balance **edge computing** and **battery constraints**. Nordic’s SoC and Taoglas antennas indicate progress, but demands will increase as devices process more data locally.
5. **Adoption and accessibility** – High prices (e.g., Quark S1 at ¥3,799 【40685185148220†L144-L160】 ) and limited distribution can hinder uptake. Assistive

technologies like TAMI® rely on funding and reimbursement to reach users 【310384296058478†L39-L50】 . Cultural acceptance of mindfulness wearables or sweat biosensors is also uncertain.

## **Outlook**

In the near term, wearable technology will continue to integrate deeper into the human body and daily life. Several trends emerge from this week’s announcements:

- **Surge in AI-enabled interfaces:** Smart glasses and biosensors are increasingly paired with large language models or edge-AI algorithms. Li Auto and Alibaba emphasise voice-controlled AR glasses 【113392561205733†L31-L107】 【40685185148220†L144-L160】 , while sweat-analysis research highlights AI’s role in interpreting complex biomarker patterns 【91071463794559†L94-L107】 .
- **Miniaturisation and low-power hardware:** Innovations like Nordic’s nRF54LV10A SoC and Taoglas’ compact antennas indicate that future wearables will be **smaller, lighter and more energy-efficient** 【797092402832830†L21-L106】 【811796135652036†L66-L112】 . This will enable battery-powered sensors to operate for days or weeks without recharging.
- **Expanded applications beyond fitness:** Wearables are moving into **medical diagnosis, vehicle control, neuro-feedback** and **mental-health support**. Partnerships between academia and industry, such as Lighthouse Tech’s collaboration with ETH Zurich and CSEM 【310384296058478†L19-L37】 , will accelerate translation from research to real-world products.
- **Regulatory frameworks evolving:** As the FDA grapples with whether features like hypertension alerts require medical-device clearance 【618631135284159†L43-L116】 , companies must be prepared for additional testing and cybersecurity requirements.

Overall, the past seven days illustrate rapid momentum in human-computer integration. While challenges remain, the convergence of **AI, microelectronics, advanced materials** and **user-centred design** is pushing wearables beyond passive trackers into active partners for health, mobility and productivity.