Project Newsletter I

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About VIVA

VIVA introduces a **compact**, **lightweight (<40g)**, and **power-efficient** eye-tracking solution by integrating **Laser Feedback Interferometry (LFI)** with **meta-optics**. Unlike traditional camera-based systems, this **camera-free approach** delivers **high-accuracy tracking** (~1 kHz sampling rate) while preserving **user privacy**.

By overcoming the limitations of **video-based** and **electro-oculography (EOG)** systems, VIVA sets a new benchmark for **ergonomic, all-day wearable eye-tracking**. The technology supports both **industrial** and **consumer applications**, while reinforcing **Europe's leadership** in **microelectronics** and **photonics**.

CAM design glasses intended as the prototype integration carrier for VIVA.

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The project is supported by the Chips Joint Undertaking (Chips JU) and its members, including top-up funding by Denmark, Germany, Netherlands, Sweden, under grant agreement No. 101139942.

Laying the foundation for our project

On July 1–2, 2024, the **first face-to-face** meeting of the VIVA project took place at **Robert Bosch GmbH in Renningen**, Germany. The meeting marked the official kick-off of this initiative.

On February 11–12, 2025, VIVA partners met in Lund for the second **General Assembly**, hosted by Sigma Connectivity. The meeting marked a key step forward in technical progress and team collaboration toward next-generation eye-tracking systems.

Advancing our collaboration and next steps!

Highlights from Recent Conferences

Our partners had the opportunity to participate in two major international events:

International Laser Safety Conference (ILSC) 2025

📍 *March 3–6, Orlando*

European Robotics Forum (ERF) 2025

📍 *March 25–27, Stuttgart*

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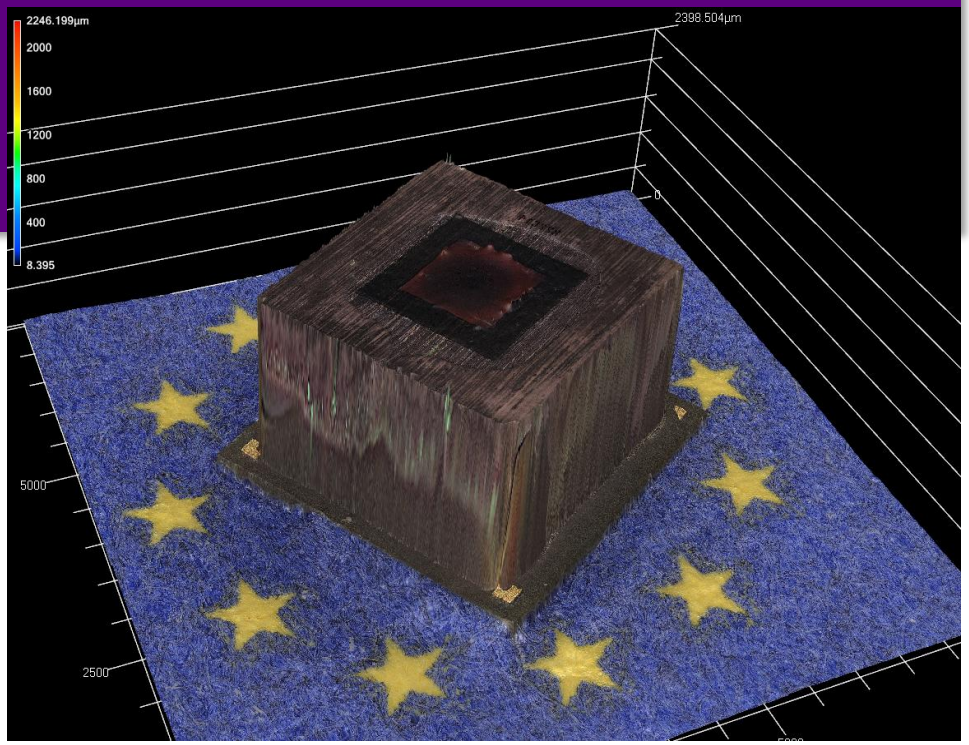
Nanometric 3D representation showing the sensor mounted on a Euro cent coin, selected to clearly illustrate the actual scale of the sensor.

The VIVA consortium is pleased to announce the successful completion of the **initial package samples**, which seamlessly **integrate Trumpf's VCSEL with an integrated photodiode and NILT's meta optical element within Bosch's optical LGA platform**. The current size of the sensor is already highly suitable for frame integration. However, the consortium is committed to **further innovation**, with upcoming iterations aimed at achieving substantial reductions in the sensor's footprint.



Nanometric3D scale visualization of the sensor placed over the European flag motif.

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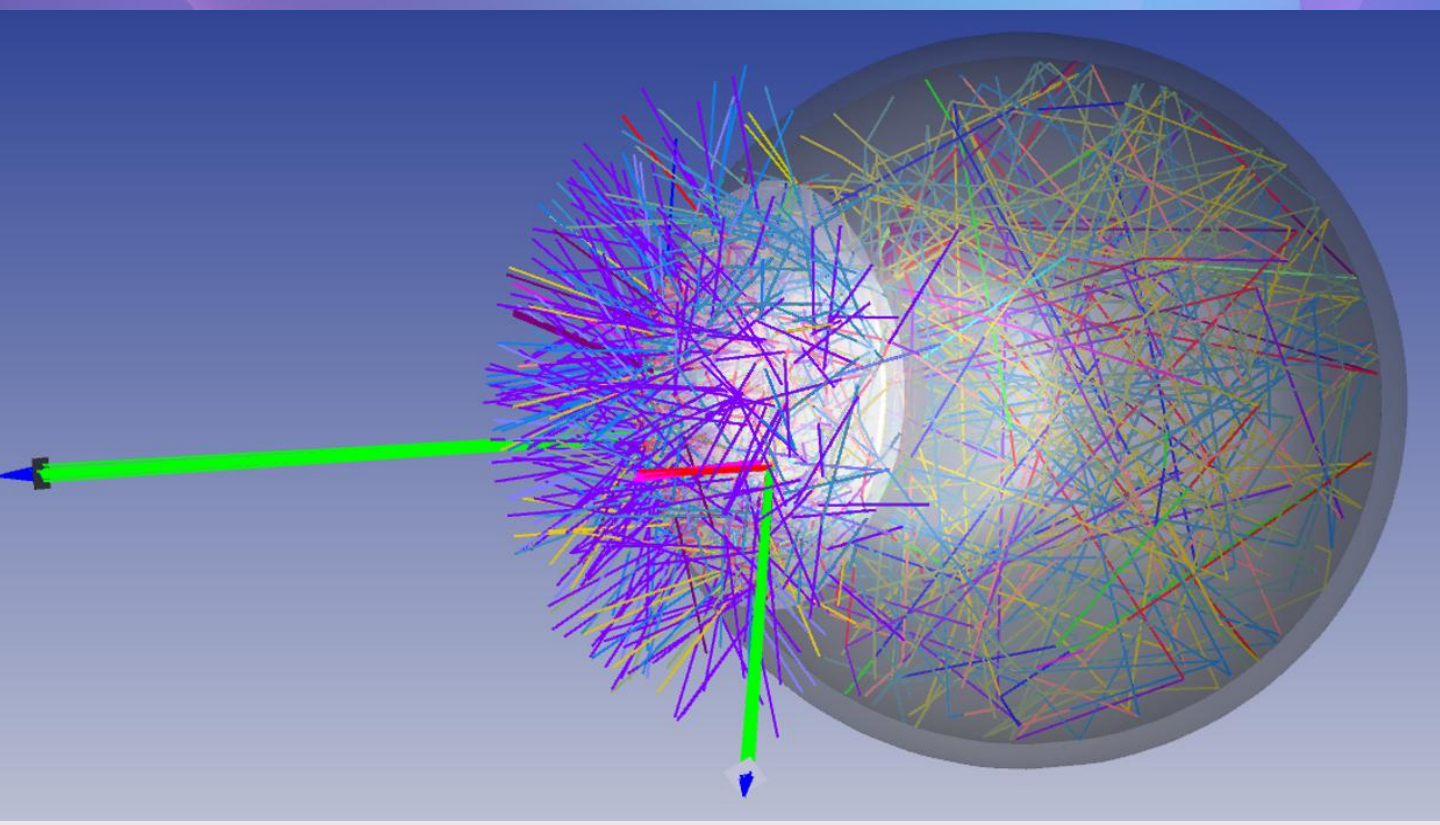

The **simulation tool** developed as part of the VIVA project provides **comprehensive analysis of eye movements** for precise eye tracking.

By calculating **intensities and optical path lengths for various sensor positions**, the tool enables the derivation of eye movement velocity and efficient evaluation of different eye-tracking algorithms.

One advantage is the flexible simulation of different scattering and absorption behaviors of surfaces such as **iris, sclera, and retina**.

The tool allows precise determination of the **relationship between sensor positioning and gaze accuracy**. This enables identifying the optimal sensor placement to improve eye-tracking accuracy and develop innovative algorithms. The tool significantly **accelerates the development and optimization of eye-tracking systems**.

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VIVA

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