

General Information

3D Microstructures Lithography on Curved Surfaces: Unlocking Scalable Rimless AI/XR/AR Optic Design

Information

Track : Semiconductor & Advanced electronics
Project City : Neu-Isenburg, Germany
Video Pitch URL : <https://www.youtube.com/watch?v=tDHs6EUMMfs>
Incorporation Date : 2026-03-26 in Germany

Public description

Most AR eyewear concepts fail not because of optics—but because they cannot be manufactured at scale. Our front waveguide lens is one of three core components enabling rimless AI/XR/AR eyewear and solving the industry's key bottleneck: manufacturability. Using 3D microstructure lithography directly on curved optical surfaces, we convert advanced photonics into scalable industrial production compatible with existing optical manufacturing processes. The solution enables integration at the semi-finished lens blank stage without requiring new factories or disrupting existing inventory and supply chains. The result is lightweight, prescription-compatible AI/XR/AR eyewear with wide field of view, premium aesthetics, and a pathway toward invisible everyday computing.

Problem and Solution

Problem

The lack of scalable optical manufacturing infrastructure preventing AI/XR/AR from reaching mass-market adoption and limiting designers' freedom to integrate compelling computing into everyday eyewear.

Solution

A scalable three-component OEM architecture enabling eyewear suppliers and designers to integrate AI/XR/AR into rimless everyday eyewear through manufacturable photonics, optics, and projection technologies compatible with existing production ecosystems. We monetize by supplying and licensing the core manufacturing microstructure optical elements on curved metal or glass molds for industrial lens production that enable the global optical industry to produce rimless AI/XR/AR eyewear at scale.

Impact

Our technology enables AI/XR/AR to move from niche headsets into mass-market everyday eyewear by solving the manufacturability barrier. Impact on industry: • Unlocking scalable production through existing optical manufacturing infrastructure • Reducing capital requirements by avoiding new factory investments • Creating a new OEM ecosystem across photonics, optics, and wearable computing • Accelerating adoption in prescription and premium eyewear markets Impact on society: • Making wearable computing lightweight, accessible, and socially acceptable • Supporting high-value jobs in photonics and advanced manufacturing • Strengthening European technological sovereignty. Targets: 120°+ FOV, prescription compatibility, rimless integration.

Product Type

Type of product

Physical product • Service • Software

Product Description

We are building the infrastructure layer for the next computing revolution: AI/XR/AR embedded into everyday eyewear. Our scalable three-component architecture unlocks true design freedom for rimless eyewear by combining photonics, advanced optics, and ultra-compact projection technologies within existing manufacturing ecosystems. Unlike today's bulky headsets, our approach removes the industry's biggest bottleneck — manufacturability — enabling rapid mass-market scaling without new factories. The result is lightweight, prescription-compatible smart eyewear that looks and feels like ordinary glasses — while transforming vision itself into the next global computing interface.

Core Technology

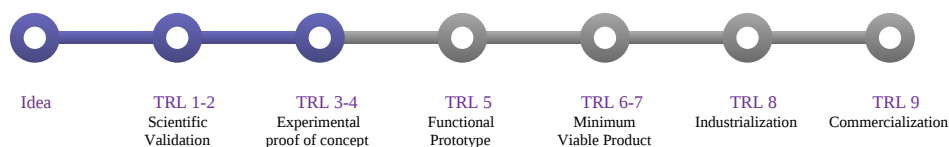
Technology Description

Our front waveguide lens is one of three core components enabling design freedom in rimless AI/XR/AR eyewear and solving the industry's key bottleneck: manufacturability. Using lithography to fabricate microstructures directly on curved optical surfaces, we translate advanced photonics into scalable industrial production. The structures are transferred into durable metal shims compatible with existing optical manufacturing processes, including injection molding and CR-39 casting—eliminating the need for new factories and new assembly lines as Ray-Ban Meta eyewear developing. The result is a mass-manufacturable XR optical diopter lens offering: • 120°+ field of view • High optical clarity • Prescription compatibility • Seamless integration into premium rimless eyewear. This enables decentralized production, faster market adoption, and introduces a new paradigm: transforming eyewear into an invisible computing interface.

Technology Tags

Speech Processing/Technology • Data Visualisation • Data Sources & APIs • Visualisation • Augmented Reality (AR) • User Interfaces, Usability • Virtual Reality (VR) • Quantum computing • Imaging, Image Processing, Pattern Recognition, Computer Vision • Artificial Intelligence (AI)

Maturity



Intellectual Property Valorization

Patent

Competing Technologies

Waveguide-based AR glasses—Light guided through transparent optical layers into eyewear. • lightguide optics —Reflective optics delivering quality but increasing device bulk. • Ultra-compact Piezoelectric LBS Projection and Photonic Sensing • Reflective optical elements (ROE) —reflective optics enabling lightweight image projection. • Retinal projection systems —Reflective projection of digital content onto retina • Freeform / lightguide optics—Compact folded optics reducing overall device size

Market

Industry Tags / Market Tags

Smart and flexible manufacturing • Industrial Machinery & Equipment Distribution (Manufacturing) • Industrial Equipment & Component Manufacturing • Robotics / Machinery & Equipment (Manufacturing) • Electronic Equipment & Components • Semiconductor Equipment • Components • Semiconductors • Microprocessors • Integrated Circuits • Lighting & LED • Display Components • Electronic Manufacturing Services • Technical & Scientific Instrumentation • Rubber & Plastic Product Manufacturing • Metal Fabrication (Manufacturing) • Product Development & Design • eCommerce

Optical Manufacturing Market (Primary Market)

Description: This market is dominated by centralized Tier-1 OEM suppliers and lens manufacturers, with production concentrated mainly in Asia. Key actors include optical labs, OEM lens manufacturers, and industrial optics suppliers. Current limitations include high capital intensity, limited manufacturing flexibility, and slow adoption of photonic innovation. Our approach introduces decentralized production of AI/XR/AR-enabled lenses using existing optical infrastructure.

Area: worldwide

Customer Focus: Platform (B2B2C, C2C, etc)

Time to Market: 2 - 3 years

Smart Eyewear Market (Secondary Market)

Description: This market includes eyewear brands, premium manufacturers, and emerging AI/XR/AR device companies. Current solutions are dominated by headset-based architectures with limitations in comfort, aesthetics, prescription compatibility, and mass adoption. Our platform enables integration of computing into rimless everyday eyewear while preserving fashion and manufacturability.

Area: worldwide

Customer Focus: B2B

Time to Market: 3 - 5 years

Optical Distribution Market (Commercialization Market)

Description: This market includes optical retail chains, optometrists, and vision service providers. The market is shifting from vision correction toward smart vision products and value-added services. Our solution enables retailers to offer prescription-compatible AI/XR/AR eyewear through existing optical channels without changing manufacturing assembly lines infrastructure.

Area: worldwide

Customer Focus: Platform (B2B2C, C2C, etc)

Time to Market: 2 - 3 years

Economic Impact

Creation of economic value across the entire eyewear ecosystem. For OEMs and optical labs: lower capital investment by leveraging existing manufacturing infrastructure, reduced production costs, and access to new AI/XR/AR product categories. For eyewear brands and retailers: higher-value products, differentiation, and new revenue streams. For end users: access to lightweight, prescription-compatible smart eyewear. At industry level, the platform supports decentralized manufacturing, faster innovation cycles, high-value job creation, and strengthens European competitiveness in photonics, optics, and advanced manufacturing.

Business Model

Business Plan

Our business model is built around enabling the eyewear industry rather than selling end-user devices. We plan to reach target markets through a B2B approach focused on optical labs, OEM lens manufacturers, eyewear brands, and industrial partnerships. Market entry will be driven through pilot projects, joint development programs, technical collaborations, and licensing agreements with manufacturing partners. Development is currently funded through founder and angel equity investment

combined with non-dilutive innovation support. Future growth will be supported through strategic industrial partnerships and deep-tech funding. We monetize by supplying and licensing proprietary manufacturing-enabling optical components, including microstructured optical elements and molds for industrial lens production. Long term, we aim to establish a manufacturing-enabled platform built around three core components that enable designer freedom in rimless AI/XR/AR eyewear. Rather than selling devices, we enable the global eyewear ecosystem to manufacture next-generation products using existing infrastructure.

Pricing

Our business model is component- and licensing-based rather than device sales. Target pricing: • Microstructured optical molds / OEM components: \$5,000–50,000 per unit depending on complexity and scale • Technology licensing: \$100,000–1M+ per industrial partner unit. This model enables scalable adoption without requiring new manufacturing infrastructure.

Other Partnerships

SPO/Shamir Optical Industry (Industrial)	Technical research collaboration focused on analysis and evaluation of the proposed optical model as a basis for an Augmented Reality (AR) system. Activities included feasibility assessment, optical evaluation, and investigation of system architecture assumptions.
Bar Ylan University (Research)	Research collaboration supporting optical feasibility evaluation and laboratory investigation of the proposed architecture under defined assumptions and technical constraints.
ATLANT 3D (Industrial)	Ongoing technical exchange exploring advanced fabrication pathways and potential future manufacturing approaches relevant to optical component development and LBS.
Fraunhofer IOF (Business)	Technical exchange and evaluation discussions initiated to explore future collaboration opportunities in optics, photonics industrialization and 3D lithography on curved concave surfaces

Past Milestones

2019-07-29 Grant	Awarded Israeli Innovation Authority (Tnufa) grant to support early-stage development of an innovative smart optical element for Augmented Reality eyewear.
2021-10-07 Grant	Awarded a second Israeli Innovation Authority (Tnufa) grant supporting continued advancement of the AR optical platform and technology maturation.
2022-06-14 Product / R&D	Patent granted: “Augmented Reality Optical and Corrective Lens System”.
2023-12-28 Technology advancement	Laboratory research activities conducted supporting technical feasibility and operability assessment.
2025-05-27 Tech/Industrial scale	Specialized lithography equipment acquired and transferred to Germany to establish internal development capabilities
2025-05-30 Equity financing	~\$456K equity funding secured to support industrialization and internal capability building
2026-03-26 Team	Benario XR incorporated and team structure formalized

Landscape

Main Competitors

Lumus Optical (Corporate) • DigiLens (Corporate) • Vuzix (Corporate) • Google Magic Leap (Corporate) • WaveOptics (Corporate) • LetinAR (Corporate)

Competitive Advantages

Our advantage is not another AR device—it is enabling manufacturability and freedom for eyewear designers. Our scalable three-component architecture combines photonics, lithography on curved optical surfaces, and existing optical production infrastructure to unlock industrial-scale AI/XR/AR eyewear. Key differentiators: • No new factories required • 120°+ FOV target • Prescription compatibility •

Rimless and premium eyewear integration• Decentralized OEM production model• Faster scaling and lower capital intensity• Laser/Ability to operate against the sunWe transform photonics from laboratory innovation into scalable manufacturing infrastructure for the next computing platform.

Known Regulatory Issues

Our solution is not classified as a medical device in its initial phase but must comply with regulations for optical products, photonics manufacturing, and wearable technologies.Key considerations include:• Optical and near-eye safety standards• Industrial manufacturing and quality certification• IP protection and licensing compliance• Future requirements for prescription integration and AI functionalitiesCompliance will be addressed early through phased industrialization and strategic partnerships.

How these issues will be managed?

We manage regulatory risks through early compliance integration and phased industrialization.Our approach includes:• Designing for compatibility with existing optical manufacturing standards• Engaging research and industrial partners during development• Building IP and licensing frameworks early• Integrating product safety and quality validation into pilot production• Conducting early assessment of future AI, prescription, and dual-use requirementsThis reduces commercialization risk and accelerates market readiness.

Risks

R&D risk – Complexity of optical performance and system integration.# Mitigated through phased validation, prototyping, and research collaborations.• Manufacturing risk – Scaling photonics into industrial production.# Addressed through compatibility with existing optical manufacturing infrastructure.• Financing risk – Capital-intensive deep-tech development.# Reduced through staged commercialization, licensing, and strategic partnerships.• Competitive risk – Faster market entry by large players.# Mitigated through IP, manufacturability advantage, and OEM platform positioning.

Traction

Media Coverage

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Funding

Non equity funding : \$570,000

Equity funding : \$456,000

Ljudmila vaeth, Business Angel : \$285,000

Noga and Ehud Ben Yakov, Other : \$171,000

Last round of funding : Angel round (or family & friends)

Team

Team strengths

4 members

Percentage of equity owned by founders: 100%

Key team members

Michael Ben Yakov

CEO Founder

<https://www.linkedin.com/in/michaelbenyakov/>

Additional Information

Social Network

Linkedin : <https://www.linkedin.com/company/benariocr/>