THE PUBLICATION FOR DESIGN ENGINEERS

DESIGNING ELECTRONICS NORTH AMERICA AN MMG PUBLISHING TITLE APRIL 2024

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ALSO FEATURED ON PAGE 14 TAMING INCREMENTAL ROTARY ENCODERS

HARDWARE, SOF



CIRCULATION Data and Software Analyst: Thomas Smart thomas.smart@designing-electronics.com

> PUBLISHER Mark Leary mark.leary@designing-electronics.com Director of Operations: Denise Pattenden denise.pattenden@designing-electronics.com

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william.leary@designing-electronics.com

jo.mccarthy@designing-electronics.com Creative Artworker: Tom Claydon-Smith

tom.claydon-smith@designing-electronics.com

Production Manager: Jo McCarthy

DESIGN

Issue 14, Vol.3 No.04 / Published 10 times per year by MMG Publishing Limited / MMG PUBLISHING US Ltd, Normandale Lake Center, 8400 Normandale Lake Boulevard, Suite 920, Bloomington NM 55437 / Tel: 866.364.0951 / Fax: 952.378.2770 Printed by: Curmings / DENA is printed on sustainably sourced paper stock ISSN 2834-7366 © 2024 MMG Publishing Ltd

CLIVE 'MAX' MAXFIELD

Editor, DENA

DENA

Connect. Influence. Optimize.

ROBOTICS

Bridging the AI Gap with SiLC Technologies' Bionic Vision

by Ralf J. Muenster, Vice President of Business Development and Marketing, **SiLC Technologies**

New developments herald significant advancements in machine vision

In the face of declining birth rates and aging populations, developed countries are grappling with a significant challenge: workforce shrinkage. This demographic shift is exerting pressure on various sectors, particularly those reliant on physical labor, such as manufacturing, agriculture, and logistics. The resultant labor shortage is not just a workforce issue; it's a catalyst for broader economic and societal impacts, compelling a reevaluation of how industries operate and innovate. In this context, the integration of artificial intelligence (AI) and automation emerges as a critical solution.

Creating an eye for robots that mirrors the complexity and functionality of the human eye is an ambitious endeavor. The quest to enhance machine vision transcends the mere improvement of camera technology. It involves developing a system capable of interpreting its environment by calculating depth and velocity, essential for Al-enhanced machines to interact effectively with their surroundings. The human eye, primarily processing motion and depth information, serves as the inspiration for this approach. However, replicating the human eye's intricate capabilities in a compact form suitable for robots presents significant challenges, necessitating the integration of various components into a single silicon chip.

SiLC Technologies' Eyeonic Vision System series represents a significant leap in LiDAR technology, offering unprecedented precision and versatility across a range of applications, from industrial automation to autonomous vehicles. The series includes four specialized versions, each tailored to specific vision requirements, from shortrange precision tasks to ultra-long-range detection. These systems leverage FMCW LiDAR technology to equip machines with nearhuman vision capabilities, addressing the critical need for accurate, realtime perception in various sectors. Notably, SiLC is offering the industry's longest-range LiDAR, as well as the industry's highest precision LiDAR at short distances, setting new

The introduction of the Eyeonic Vision System Mini further underscores SiLC's commitment to advancing machine vision. This compact,

benchmarks in the field.

high-precision system is designed for applications where sub-millimeter depth precision is paramount, such as warehouse logistics and AI machine vision tasks. The Eyeonic Mini's integration of advanced LiDAR technology and silicon photonics sets a new industry standard for performance and efficiency, revolutionizing how robots perceive and interact with their environment.

SiLC's suite of development kits, built upon the Eyeonic Vision Sensor platform, offers OEMs and systems integrators a comprehensive solution for rapid prototyping and market entry. These kits are designed to meet the unique demands of various vision system applications, from short to ultra-long ranges, providing a scalable and cost-effective solution for large-scale deployment in the machine vision sector.

As the global machine vision and robotics market continues to expand, SiLC's innovations are poised to play a pivotal role in shaping the future of autonomous technology. The Eyeonic Vision System series and the Eyeonic Mini represent significant advancements in machine vision, providing machines with the depth perception, velocity measurement, and polarization information necessary to navigate and

interact with the physical world effectively. With products that offer robust, scalable, and precise vision capabilities, SiLC Technologies is not merely keeping pace with market demand but is actively driving the evolution of machine vision towards a more intelligent and interconnected future.

www.silc.com



Short-range point cloud visualization captured from approximately 12ft away, showcasing intricate details on a table. The Eyeonic Vision System Mini by SiLC delivers unparalleled precision for close-range objects and introduces per-pixel Doppler data, ushering in advanced features and functionalities for robotics. The lower right point cloud highlights the dynamic velocities of a rotating globe and fan, as detected by the Eyeonic Vision System Mini.