

OMNITRON

S E N S O R S

PIC FOR AUTOMOTIVE LIDAR

Prepared for EPIC

28 September 2020

THE PROBLEM

MEMs silicon process has been flat 10+ years.



1 UNRELIABLE

Last < 6 months

2 EXPENSIVE

Cost \$10's of thousands

3 LOW PERFORMANCE



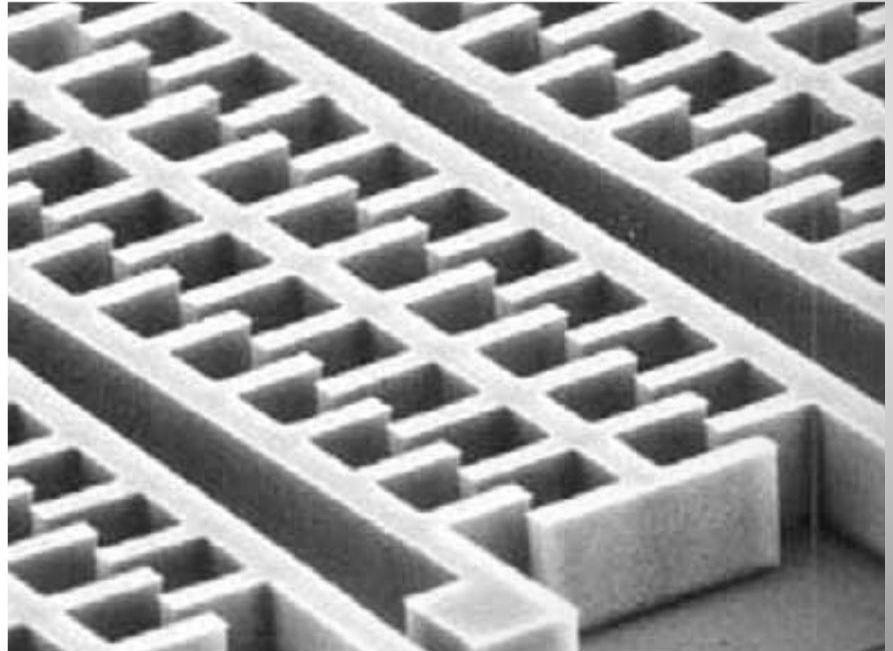
SILICON PHOTONICS REVOLUTION

High performance that scales

**REDUCE COST FROM \$10K'S
TO \$100'S**

**10X IMPROVEMENT IN
PERFORMANCE**

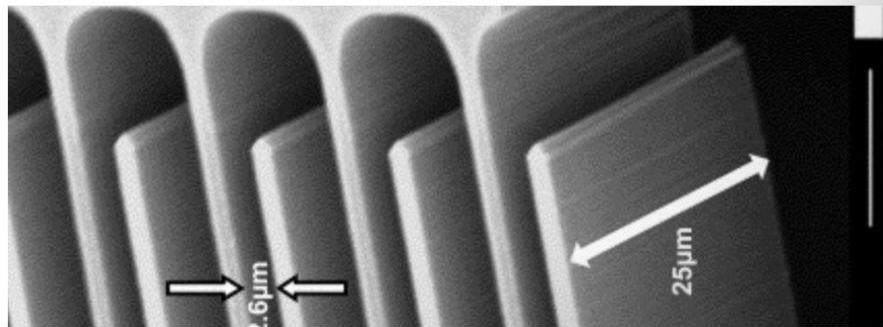
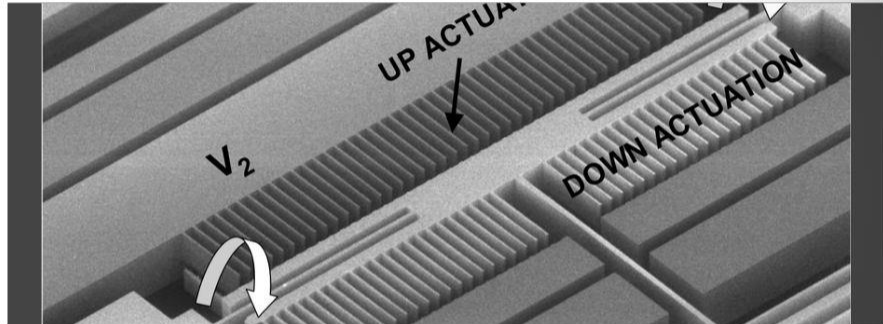
**RELIABILITY THAT GOES
FROM MONTHS TO YEARS**



SILICON ASPECT RATIO

Addressing a fundamental limitation in process to improve performance

**TODAY'S ASPECT
RATIO IS
LIMITED TO 10:1
OMNITRON IS
GOING TO 100:1
ASPECT RATIO**



PRODUCT DIFFERENTIATOR

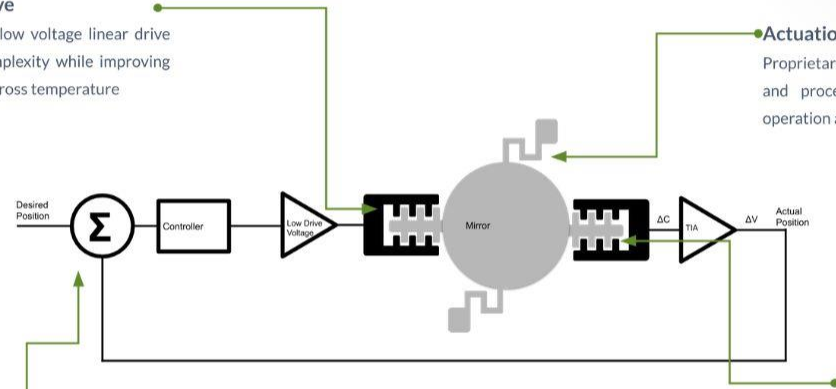
INSPIRED BY NATURE TO DEVELOP A CLOSED LOOP SOLUTION IN MEMS THAT PUSHES THE FRONTIER IN SILICON PROCESS.

Linear drive

Proprietary low voltage linear drive reduces complexity while improving operation across temperature

Actuation

Proprietary actuation through design and process optimized for linear operation and modal rejection



Proprietary Closed loop design

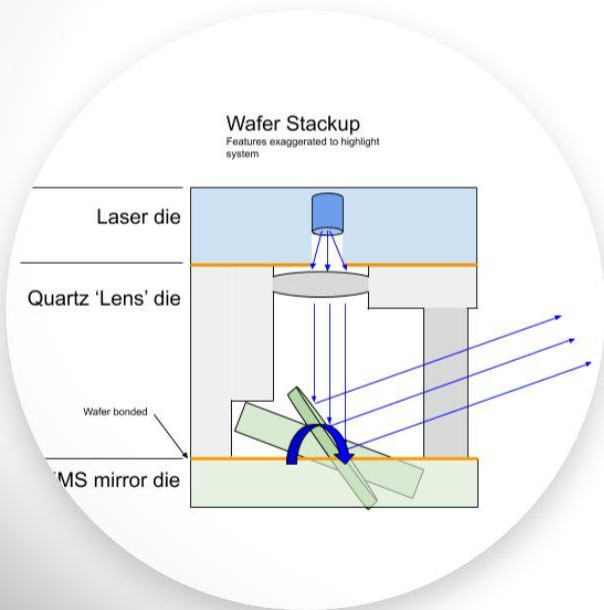
Robust and simple closed loop design inspired by how nature handles vibration and eliminates loss of data packets and frames!

in-situ capacitance

Revolution in MEMS IP provides direct measurement to where the mirror is (same with how we know where we are looking with our eyes)

MEMS OPTICAL SUBSYSTEM

Simple and scalable solutions

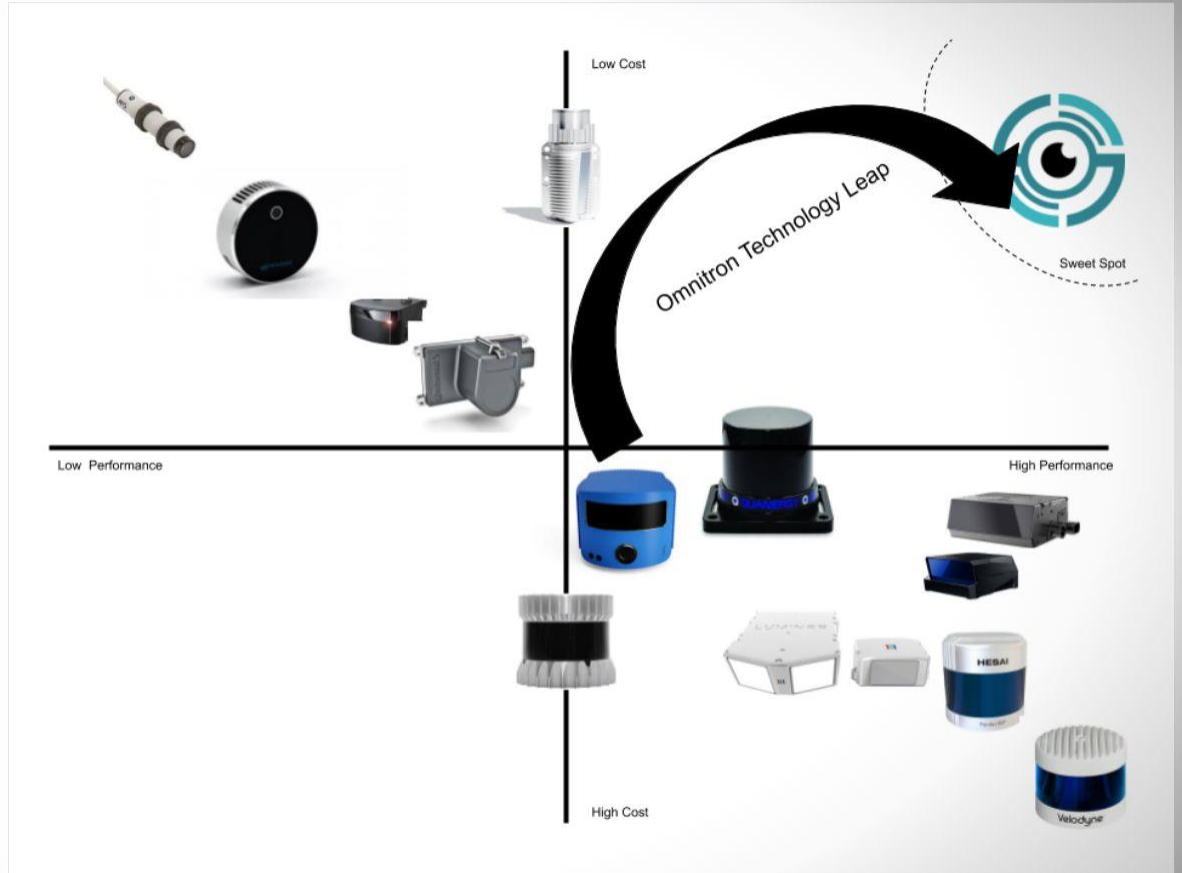


WINS FOR LIDAR

1. **Low Cost:** Leveraging large-scale silicon batch processes and using highly accurate features with low cost component and system level cost
2. **Small:** Integration of laser in MEMS optical subsystem allows for LiDAR to be seamlessly integrated into vehicle platform and allows new market verticals in drone and IOT markets
3. **Robust:** Leveraging wafer fusion bonding techniques allows for robust attachment of MEMS mirror and laser which addresses an endemic problem with all other solutions in the LiDAR and Telecom markets

LIDAR COMPETITIVE LANDSCAPE

SILICON PROCESS INNOVATION UNLOCKS MARKET





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APPENDIX

PROVEN TEAM



CEO | ERIC AGUILAR

Perception Sensors Expert

Lead Engineer at leading AV companies

15+ years of experience in sensors



CTO | TRENT HUANG

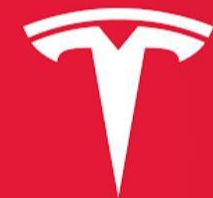
Ph.D. Cornell

20+ patents

20 + years of experience in MEMS



The
Moonshot
Factory



TESLA

Google



ERIC AGUILAR

CEO

ERIC AGUILAR (CO-FOUNDER, CEO): ERIC HAS A TECHNICAL DEGREE (CAL POLY/USC) AND STARTED HIS CAREER BY BUILDING SENSORS FOR DRONES AT US NAVY RESEARCH LABS. THESE SENSORS WERE FUNDAMENTAL TO UNLOCK AUTONOMOUS FIGHT AND FURTHER ADVANCE DRONE CAPABILITIES. DURING HIS TIME AT THE NAVY, HE JOINED A COMPANY THAT WAS WORKING ON COMMERCIALIZING A SENSOR THAT HIS TEAM WORKED ON, THAT LED TO A STARTUP "LUMEDYNE" THAT BUILT A MOTION SENSOR THAT WAS LATER ACQUIRED BY GOOGLE FOR \$85M. HE THEN TRANSITIONED TO DEVELOPING AUTONOMOUS SYSTEMS. HE WAS THE AVIONICS LEAD AT GOOGLE[X] PROJECT WING AND ENABLED AUTONOMOUS FLIGHT FOR THEIR COMMERCIAL DELIVERY DRONES. HE THEN WORKED FOR ELON MUSK ON THE SENSOR INTEGRATION EFFORTS FOR MODEL 3 THAT ALLOWED FOR AUTOPILOT. AND WAS MOST RECENTLY AT ARGO AI (SELF-DRIVING COMPANY FUNDED BY FORD AND VW) AND LEAD THE SENSOR INTEGRATION EFFORTS FOR THEIR FLEET OF ROBO-TAXIS.

Notable Accomplishments:

LED ARGO'S SENSOR TECHNOLOGY SUITE THAT ENABLED **AUTONOMOUS DRIVING**

TESLA'S MODEL 3 SENSOR INTEGRATION LED THAT LED TO SUCCESSFUL **PRODUCT LAUNCH**

LED GOOGLE[X] WING AVIONICS TEAM TO DEVELOP AUTONOMOUS FLIGHT FOR CONSUMER **DRONE DELIVERY**

LED EXECUTION OF LUMEDYNE'S MEMS IMUS THAT LED TO **GOOGLE ACQUISITION**

GROUND UP (IC LEVEL) DEVELOPMENT OF GPS RECEIVERS AND RADAR SYSTEMS FOR **BLACK DART AND SOCOM DRONE PROGRAMS**

