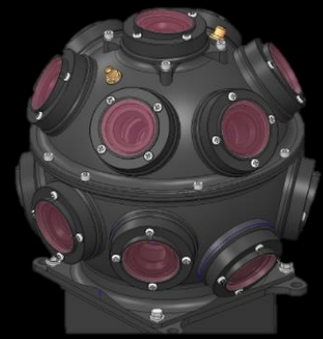
CIRCLE OPTICS

Real-Time Spherical Image Systems

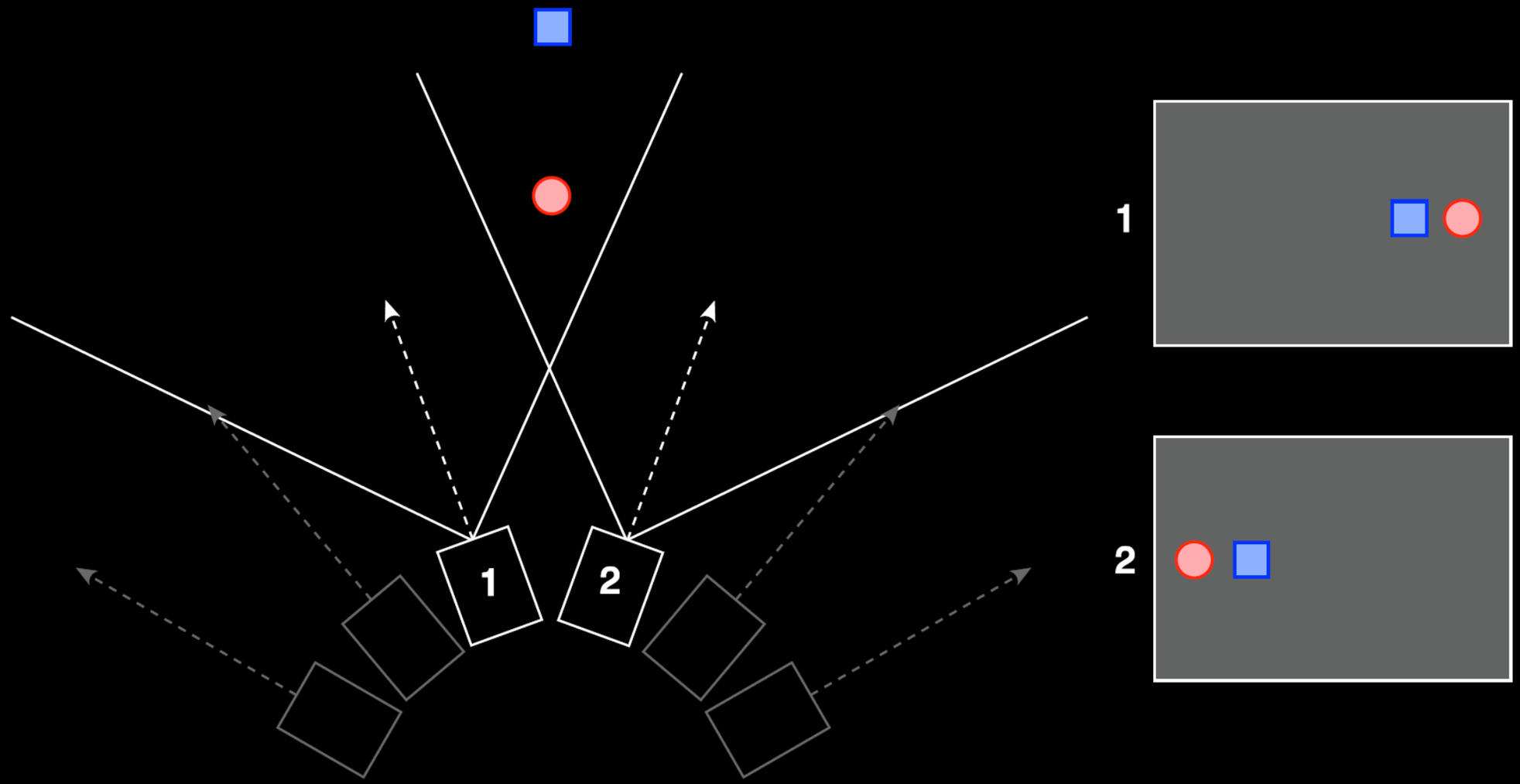
This is 360 Degree Imaging Today – Barbaric!

360º Spherical Capture Today

- Multiple Cameras
- Uses overlapping fields of view
- Parallax issues in every frame
- High post processing burden
- Not Real-Time
- Intensive SWaP



The Fundamental Problem - Parallax



Higher Resolution = Bigger Parallax

A Problem That's Worth Solving

Capturing Errorless, Real-Time, Spherical Video is Not Possible with Today's Systems:

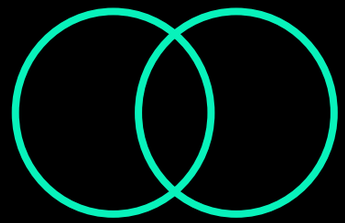
- Poor Circular capture. No Spherical Capture
- Manual Post Processing and Image Stitching
- Insecure Data Pipeline Integrity

Holding Back Realization of Edge AI and Real-Time Situation Awareness.

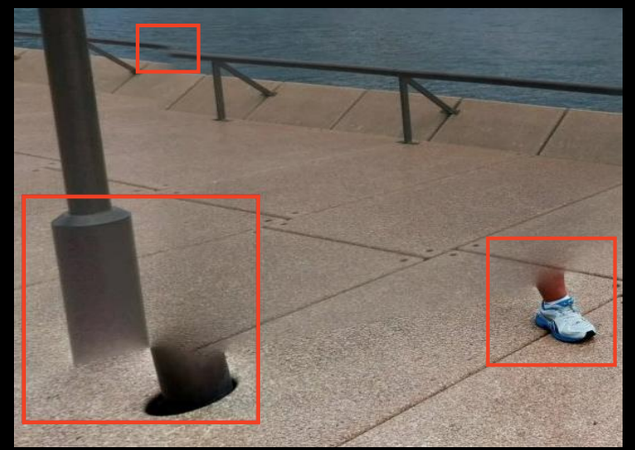
The Industry is begging for better capture methods so that Edge Analytics and Immersive Remote Situational Awareness can be made practical.

Bad Physics

Overlapping Fields of View



Bad Content

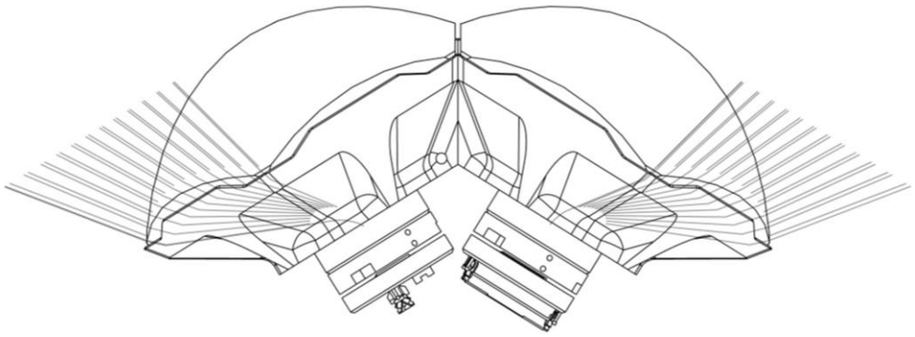


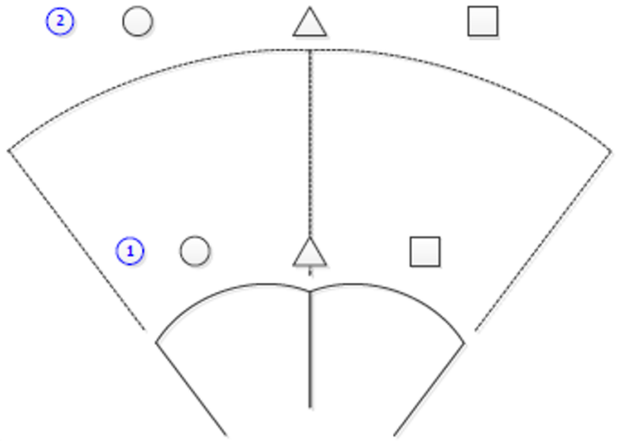
Our Solution: New Imaging Technology

“You press the button; we do the rest”
- George Eastman

Polygonal Lens Systems

From Our Very First Hardware Prototype - 360º Image Produced Without Any Stitching!

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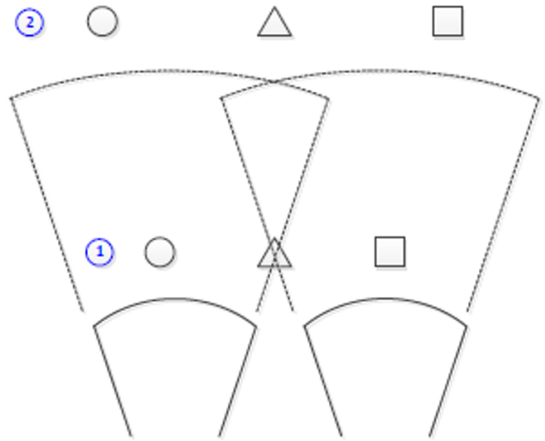
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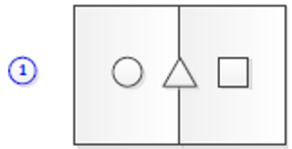
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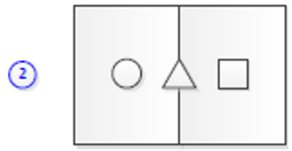
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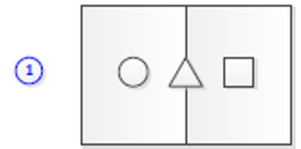
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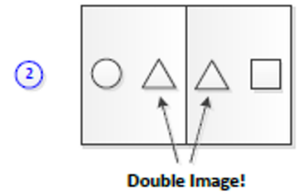
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Double Image!

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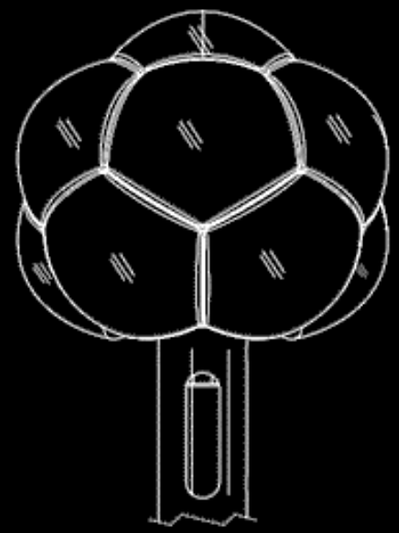
Spherical Imaging Systems by Circle Optics

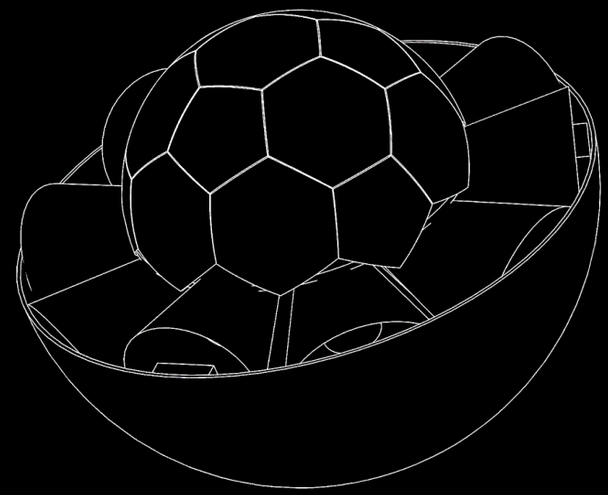
Our Technological Edge

- Method of Aligning Polygonal Fields of View to Fill 360° Sphere
- Real-Time Image Fusion and Object Detection
- Camera Systems Development Know-How
- Manufacturing Methods and Design Patents
- Platform that is extensible with Technology Partners



Doing “Physics Right” enables

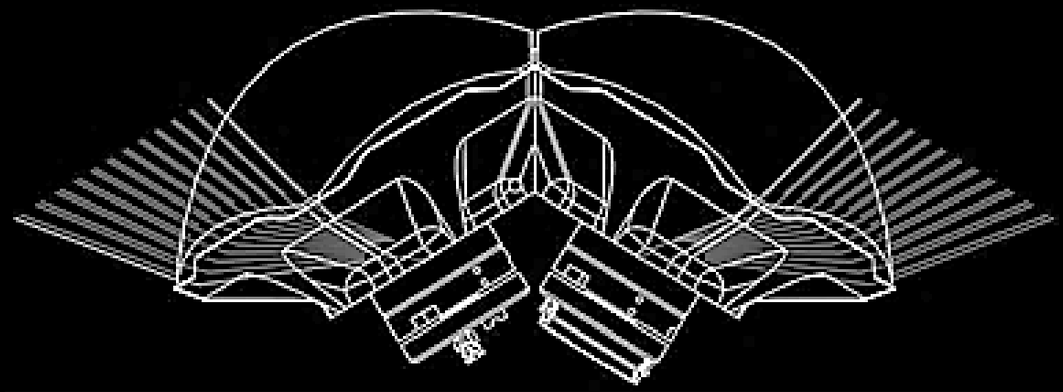
- Volumetric and Other Physical Analytics
- Accurate 3D / Spherical Mapping
- Image Feature Extraction Accuracy and Edge Analytics
- Secure Data Pipeline Beginning at the Source of Capture



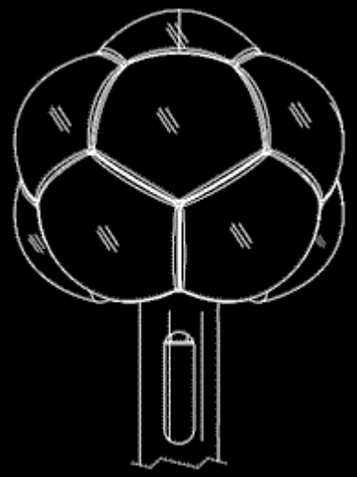
Our Differentiators

Our Defensible Technology and Approach

- Closely held Optics Design and Sub-pixel Image Alignment Algorithms
- Methods for aligning Polygonal Fields of View to fill 360º and Spherical space
- Manufacturing and Design Patents
- Extensibility of the Physics and the Platform
- World-class Optics and Imaging Technology Supply Chain
- Camera Development Know-how

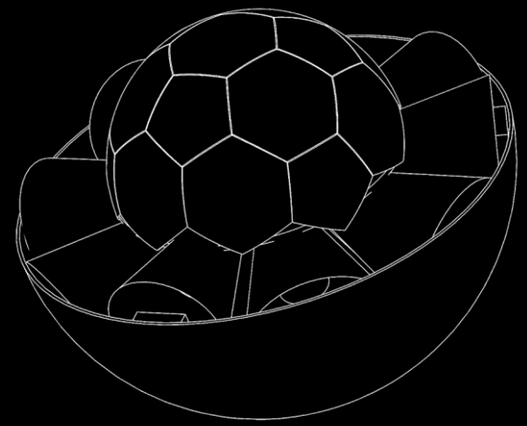


Technology Development – TRL 7



Hydra Camera

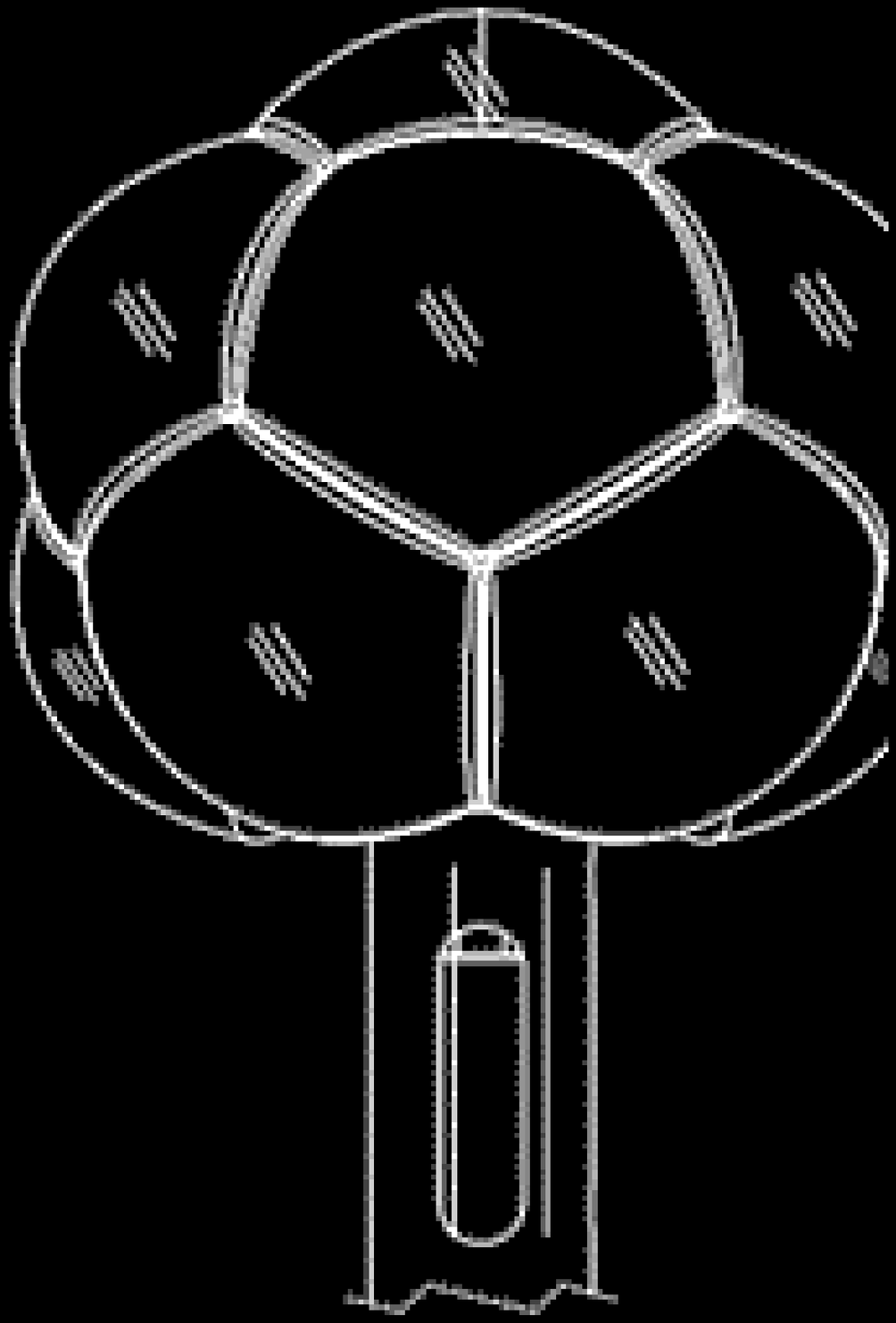
Field of View	360° h x 300° v
Resolution	72 MP
Frame Rate	30, 60 fps
Color	10, 12-bit
Dynamic Range	72 dB
Distortion	<2%



Medusa Camera

Field of View	360° h x 160° v
Resolution	500MP
Frame Rate	60, 75 fps
Color	14-bit
Dynamic Range	99 dB
Distortion	<2%

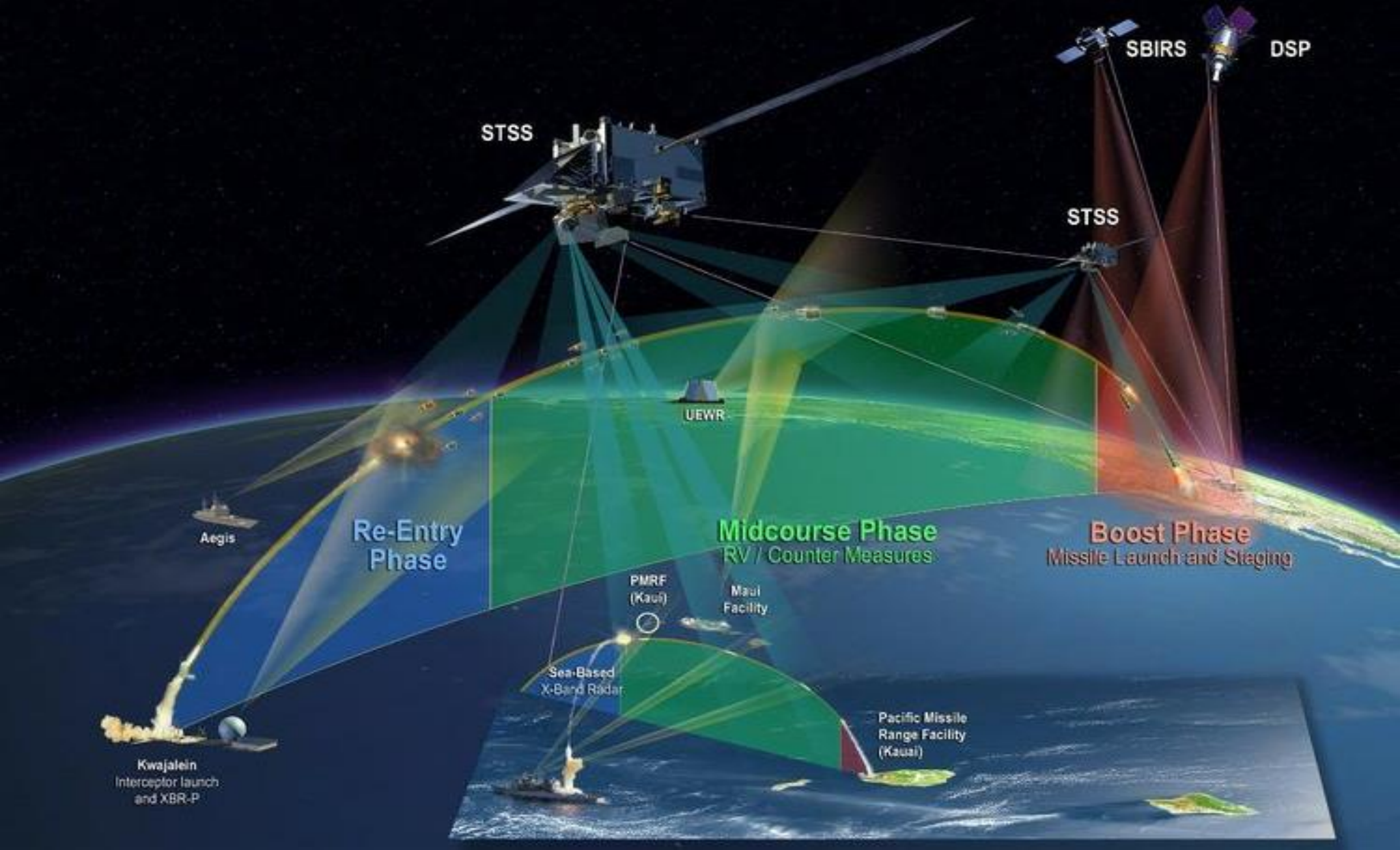
We will miniaturize, ruggedize, and/or customize for different Markets, including IR , UV, and LIDAR



Hydra Applications

www.x20.org

Medusa Applications


SBIRS
DSP
STSS
STSS
UEWR
Aegis
Re-Entry Phase
Midcourse Phase
RV / Counter Measures
Boost Phase
Missile Launch and Staging
PMRF (Kauai)
Maui Facility
Sea-Based X-Band Radar
Pacific Missile Range Facility (Kauai)
Kwajalein
Interceptor launch and XBR-P

Our Team – Experts in Camera Technology

ZAK NIAZI
Chief Executive Officer & Founder

IAN GAUGER
Chief Operating Officer

ALLEN KRISILOFF
Director of Engineering

ANDY KURTZ
Director of Research & Development

LUC VINCENT
Advisor, Creator of Google Street View

TED SCHILOWITZ
Advisor, Founder of RED Digital Cinema

- +8 Others with Backgrounds Including IMAX, Kodak, L3 Harris, etc.
- HQ in “The Imaging Capital of the World” - Rochester, NY, USA
- Circle Optics is a privately held Delaware Benefit Corporation

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