**Docket #:** S17-263

# Holographic Beam Steering Device

Researchers at Stanford have developed a highly efficient (>90%) holographic beam steering method for obtaining distance information of objects nearby, with applications from autonomous vehicles to home appliances. Combining simple and already matured components, this innovation enables a multi-selective scan method for fast and effective mapping. Existing beam steering methods (both mechanical and electrical) can increase the volume and cost of a device and have low efficiency. The Stanford innovation features a wavelength tunable laser for producing reading beams with different wavelengths, and a recording medium for storing multiplexed holograms. The output beams diffracted from the holographic medium have different direction and at least two or more divergent angles. The shape, size and direction of the output beam can be easily controlled.

**Related Technologies:**
Stanford docket S17-078 - **Mechanically Tunable Metasurface for Optical Modulation, Beam Steering**
Describing a metasurface with high reflectance and large phase modulation for use as optical phase modulators or beam steering device (Lidar).

Stanford docket S17-079 - **Multi-Wavelength Laser with Perpendicular Polarization**
Describing a multi-wavelength laser with perpendicular polarization, which supports easy and independent measurement in various optical sensors for improved accuracy and speed.

Stanford docket S17-487 - **Metasurface Micro-Cavity for OLED Color Purity**
Describing a simpler and low-cost micro-cavity design for color tuning of organic light emitting devices (OLEDs) for display applications.

Stanford docket S18-193 - **High-Efficiency Broad-Angle Dielectric Diffraction Grating**
Describing a dielectric diffraction grating that provides high (near-unity) diffraction

efficiencies in an ultra-compact volume. With applications in a variety of optical systems such as telescopes and VR.

Stanford docket S18-495 - **Metasurface Display for Augmented and Virtual Reality**
Describing a near-eye display enabling both Augmented Reality (AR) and Virtual Reality (VR) modes with dynamically controlled contrast.

## Applications

- Self-driving cars; home appliances (e.g., 'robot' vacuum cleaners)

## Advantages

- Several hundred hologram can be recorded within volume holographic media (multiplexing)
- Tunable laser can have narrow linewidth (100kHz) and wide wavelength tuning (50 ~ 80 nm)
- High efficiency (>90%) is possible
- Design combines simple and already matured components

## Patents

- Published Application: 20190064417
- Issued: 10,877,200 (USA)

## Innovators

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