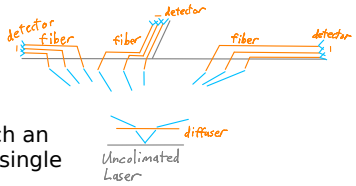
errata

Synthetic aperture. Theoretically, combining multiple points interferometrically should cause the received speckle to oscillate amplitude more frequently (per travel distance), due to receiving waves in different phases simultaneously. Thus, speckle pattern feature size may shrink as may be expected of an image taken by a larger diameter lens. Some tinkering with the optics (eg. removing diffuser, interferometric lens combining) may be appropriate.

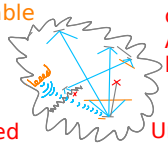


Lithography 'overlay' is the only known production use for such an elaborate tracking system emphasizing accurate locaton of a single point source of light.

Absolute position correlation to relative 'single-pixel' fiber optic readouts may be indirectly calibrated to single-microstep stepper motor travel along any single axis, as these motions typically achieve extreme precision. Especially after significant travel in a single direction has overtaken any backlash. Otherwise, fiber optic single pixel readouts may not directly indicate absolute position (which would result in a precise rather than accurate measurement), and may not have any absolute units.

Magnetic tracking can be calibrated by even brief visibility to camera, and remains observable behind obstructions.

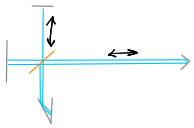
External cameras require substantial processing or bandwidth. Moreover, API forward compatibility becomes a major concern.



Obstructed view from central location.

Unwieldy high rotational inertia from distant camera mount.

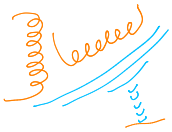
Placing cameras on device improves convenience. However, tracking accuracy may be much less, cost may be higher, and obstructed objects can only be tracked magnetically. Rather than adding more hardware in these cases, software VR ergonomics (ie. very large HOTAS controls, headlook menu systems, and controller gesture/button vehicle/standing mode switching) in software is likely to be far more practical.



Linear Interferometric - coherent or white-light - encoders may offer extreme accuracy (particularly when counting whole 'steps'). However, realizing this accuracy may require linear tracking of flat mirrors, precisely manufactured retroreflectors, precise reference beambath changes, and/or fast signal processing. All of these requirements are expensive, limiting, or both. As such extreme accuracy is not required for VR tracking, but may be for manufacturing tools (ie. photolithography overlay), this is a technique to consider for as appropriate for specific use cases.

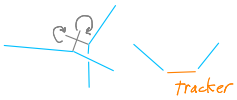
Radio phase comparison and time of flight. Accuracy may be limited by frequency response of components. Accuracy may degrade due to multipath. Frame rate may be limited by correlation time. Computer processing may be necessitated by correlation, especially under multipath.

Sometimes convenient. Accuracy, and framerate may be fundamentally limited.



Magnetic phase tracking may not have adequate precision. Differential amplitude signal may be more precise.

Lighthouse tracking has proven workable, with some limitations and reported reliability issues. Only worthwhile to support legacy (ie. 'SteamVR') software.



Lens diameter is limited due to spinning mass limitations.

Photosensor response times, and diode laser modulation rates, for commodity devices, have been barely adequate. Any degradation is likely to cause failure.

Any 'bumps' in mechanical spin cause loss of precision.

Power consumption and cost per tracker has remained high for commercially available devices, making accessories expensive and require frequent recharging.

Accuracy is not achieved unless reference trackers are placed. Due to high cost, and lack of integration with existing lighthouses, 'floor' position tends to 'shift' several centimeters with every power cycle.

Safety problems with ~200mW lasers may necessitate overly cautious fail-safe disablement of otherwise usable devices.

Only obvious advatage of Lighthouse tracking is the lack of computer processing required. Modern technology has been displacing scarce laser barcode scanners with computer processing of camera images for more than ten years now. Moreover, the disadvantages of laser scanning absolutely limit range, absolutely preclude communication over the same channel, and raise unnecessary safety issues.