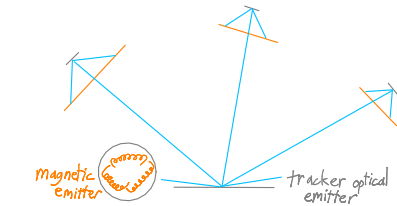


External Camera



Differential magnetic emitters may continue precise position/rotation tracking beyond-line-of-sight, with similar location specific communication and identification advantages.

Unmatchable advantages.

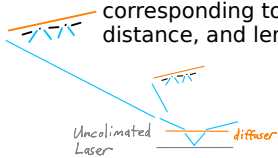
- *) Complete coverage.
- *) High resolution (up to ~10cm lens diameter).
- *) High framerate (up to ~1000fps).
- *) Wide compatibility - several protocols allowing mix of different camera framerates and capabilities.
- *) Simultaneous integration with other position trackers.
- *) Standalone with onboard pixel tracking and non-networked wireless out-of-band protocols.
- *) Dedicated spatial channel allocated to each tracker.
- *) Communication, location specific and directional.

Inertial tracking may interpolate between positions/rotations from other resources.



Speckle Sense

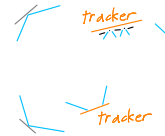
SpeckleSense can be understood as an especially detailed laser shadow projection structured light technique, with the size of 'speckles' corresponding to wavelength, distance, and lens.



As with any structured light or interferometric position tracking, whole steps must be counted specifically to overrule any accumulated errors from 'microstep' interpolation.

Wavelength division is necessary for multiple speckle sense emitters, to prevent overlapping projected patterns.

Due to limited number of wavelengths separable by inexpensive, compact, robust filters (as few as two), if multiple trackers are used, the trackers must be cameras (eg. image sensors from HID mouse), since only few emitters can be used simultaneously.



Lighthouse



Precision more acceptable than unmarked camera inferring position from relative shift of nearby scenery. Substantial, severe, disadvantages.

Emitter Location-Specific Communication Protocol

Modulation illustrated is of single magnetic or optical emitter (ie. LED), not RF, not wavelength divided. Usually short UV 365nm wavelength is strongly preferred for precision.

Any non-default emitter amplitude modulation must be demanded of that specific emitter by RF packet.

Non-directional communication (ie. from magnetic emitter instead of LED to camera) may use CDMA codes with 2^6 addresses or TDMA with random timeslots unless non-random TDMA timeslots have been demanded.

Demand RF packet begins with a high-energy RF pulse to cause MCU interrupt from analog bandpass and diode envelope detector, follows with emitter identifier, and ends with a magic number corresponding to the demand.

Fragile network protocols, complicated or expensive network hardware (ie. Bluetooth), are unnecessary and **strongly discouraged**.



Default mode, identifier 8bit or 10bit, followed by 2byte rate of acceleration change. Identifier immediately repeats if accelerometer output is unnecessary or unavailable.

Continuous emission, minimum power.

Ensures fast tracking with low framerate cameras and minimal software complexity.

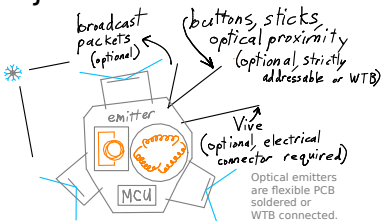
Arbitrary data. Button press, accelerometer output, acknowledgement of demand, etc.

RF packet of similar format to demand packet may be used instead (discouraged).

Blink.

Usually an acknowledgement of demand, to locate a specific emitter quicky.

Object Emitter *



Standard single PCB with all components for any sub-mm line-of-sight accuracy calibration, beyond-line-of-sight precision, and inputs from buttons or sensors.

VR Exoskeleton Tracking

Exoskeleton relies on Force-FeedBack, does NOT need controllers with buttons, sticks, etc.

Magnetic bases must differentially compare received power output from optically known positions to calibrate.

