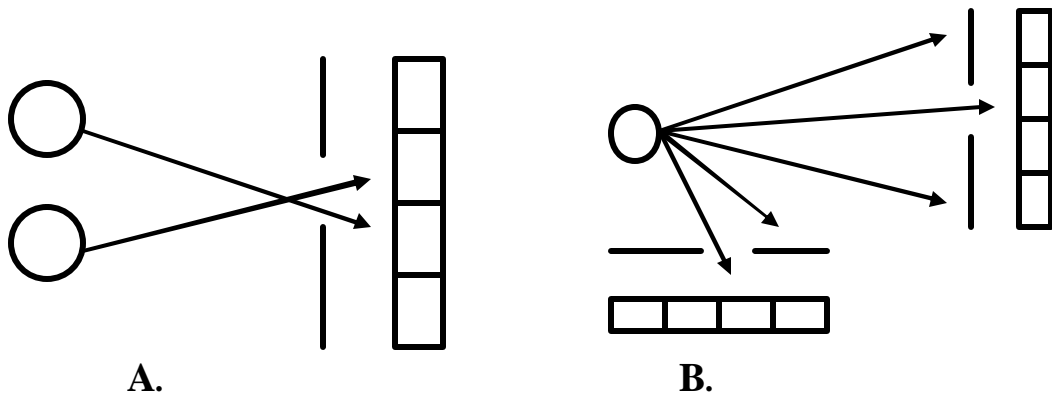


Eliminating shadow by taking multiple images:

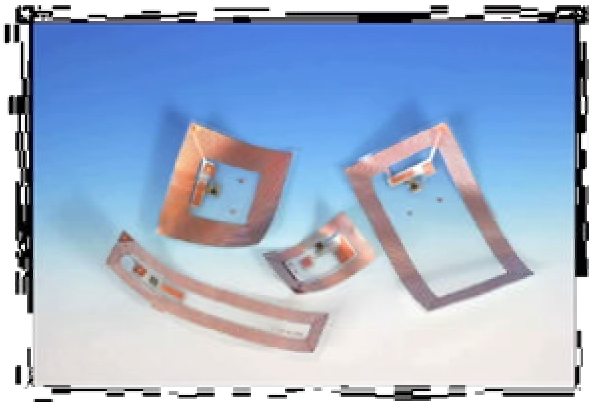
Possible methods include taking the mean, median, or sorting the intensity. Mean and median can have problems because in certain conditions shadows can dominate the images, thus the results will favor the shadows. Instead sort intensity values, but taking max can lead to saturated images, instead, take second or third highest intensity pixel.

Question: How can we build a box that can distinguish which signal is coming from which device?



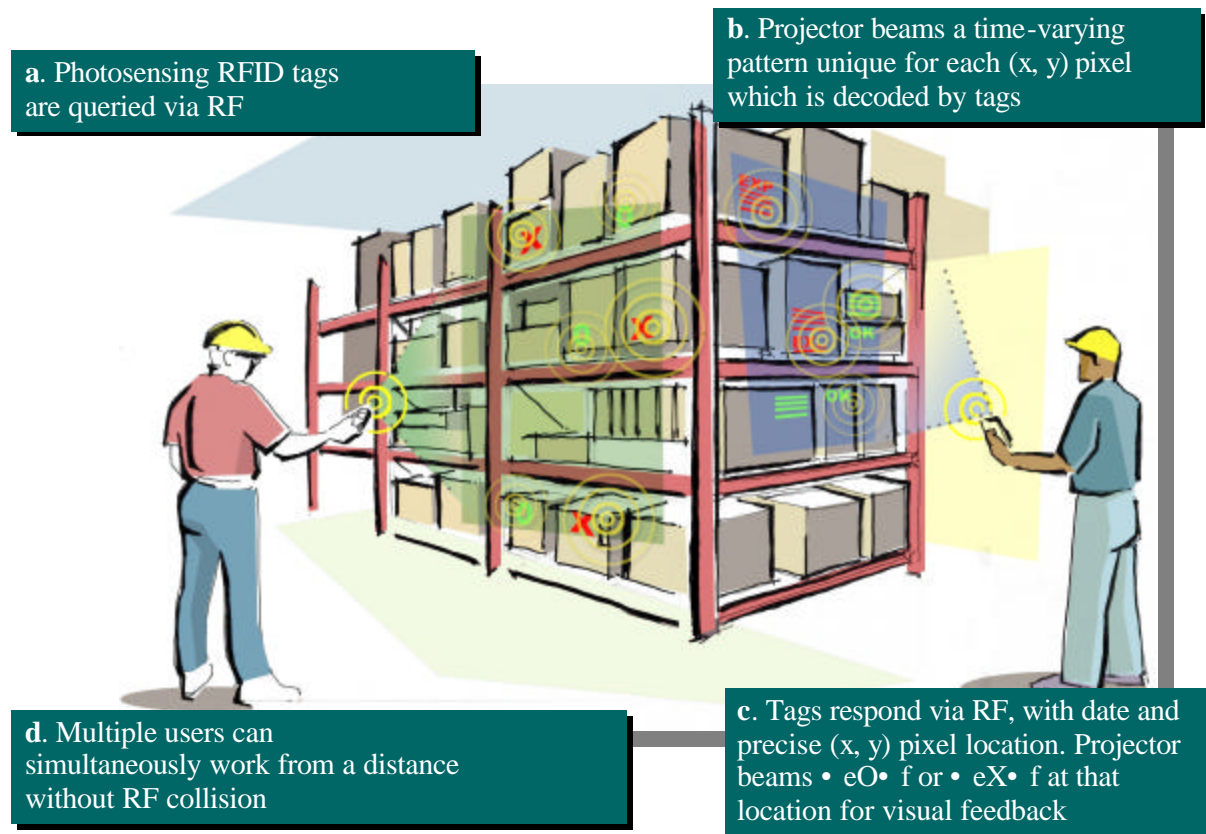
Setup (A) blocks most of the sensors, now when a sensor detects a signal it can determine the angle that the signal must have traveled. The angle does not give away the distance, to find the actual location of the device two sensor boards are required. Using two or more boards the signal can be triangulated, yielding the exact location of a device (see figure B).

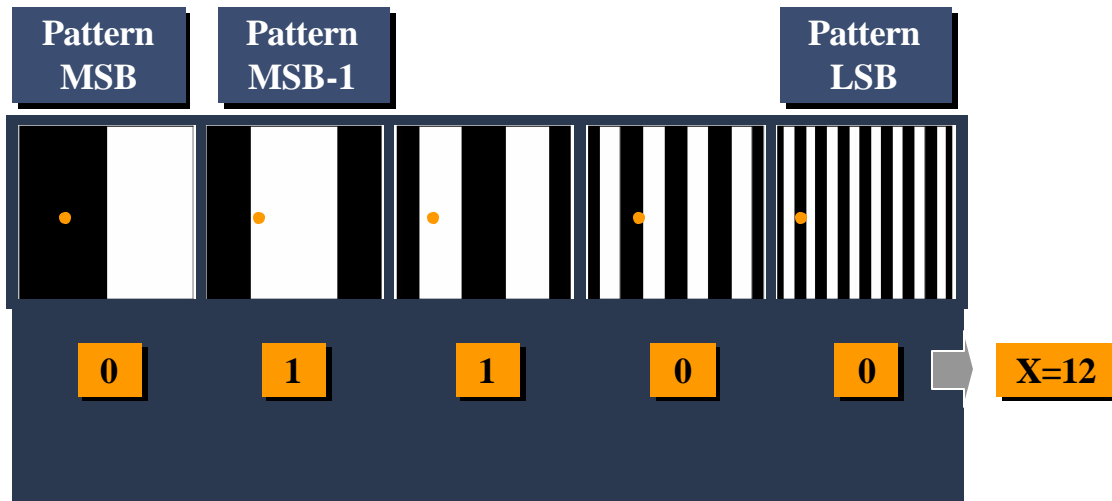
Blinking Led's are used for high speed motion capture. Sony has idea to use blinking leds on billboards to transmit information such as a url to people's cell phones.



RFIDs are extremely small, cheap, and require no power supply. They respond to certain signals by sending out their own signal. They can transmit enough bits to send a useful amount of information such as the exact piece of merchandise the tag is on in a store instead of a generic security tag. RFIDs use an encrypted hash that makes them difficult to mimic despite being able to observe both the sender and receivers behavior.

Photo-sensing RF tag:





For each tag

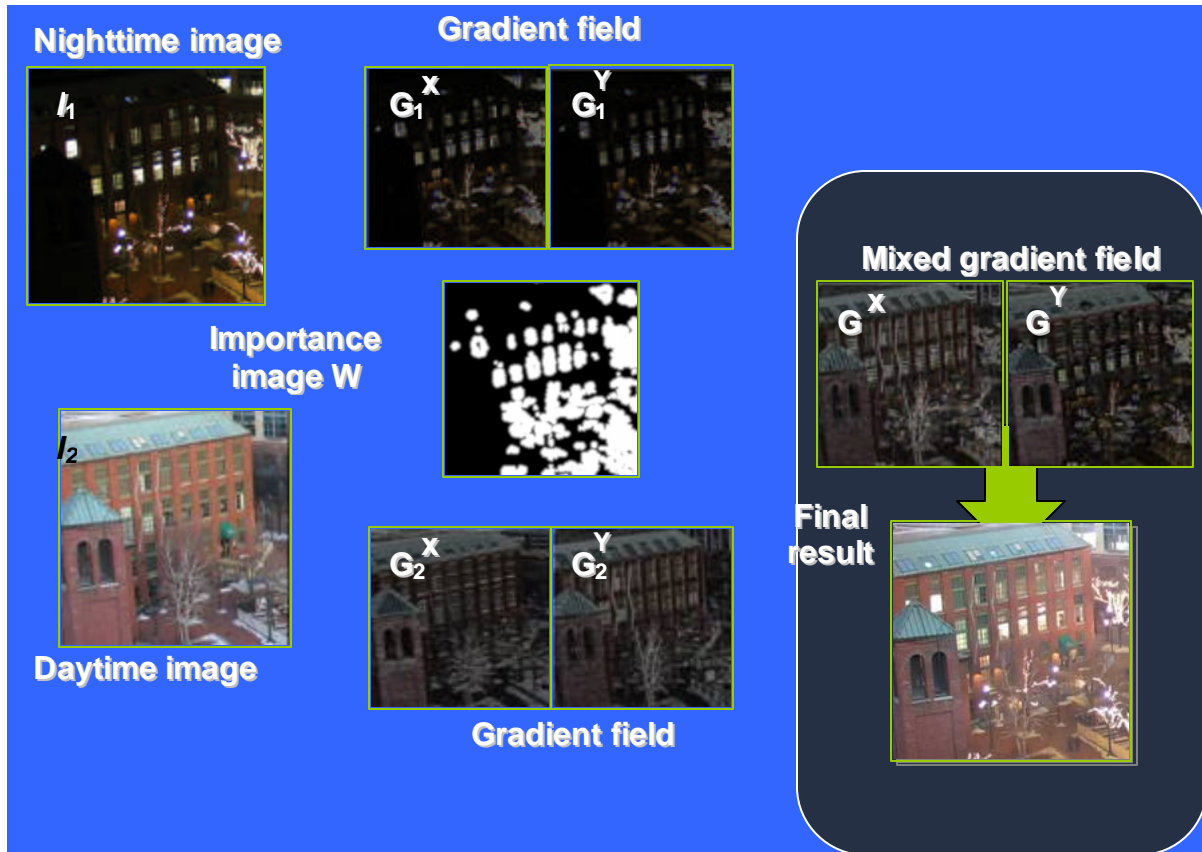
- From light sequence, decode x and y coordinate
- Transmit back to RF reader (Id, x, y)

Tags can quickly decode information sent by projector. Since the number of combinations doubles with each flash (2^x), with just 10 flashes 1,024 unique tags could be identified.

3 Main Methods

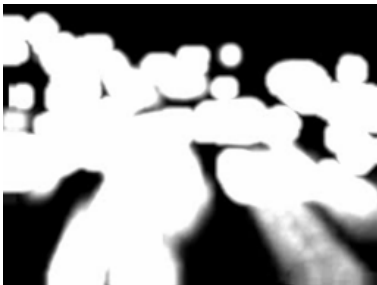
- Temporal Modulation
- Demodulating Pinhole Camera Led
- Binary Encoding – find a tag in very few frames

Day/Night Fusion:



Combining day and night in an intelligent way provides night scene with better context and more detail.

Video Enhancement



Fusion increases contrast and detail in images.