

- EO
- AEO
- RF
- GNSS
- RAY

# SE-IR-SENSOR



FAST

## SENSOR MODELLING TOOL FOR SE-RAY-IR AND SE-FAST-IR

SE-IR-SENSOR is a library for 1st order modelling of generic optronic sensor technology. It provides state of the art infra-red sensor effects in SE-RAY-IR and SE-FAST-IR image rendering software

### Features

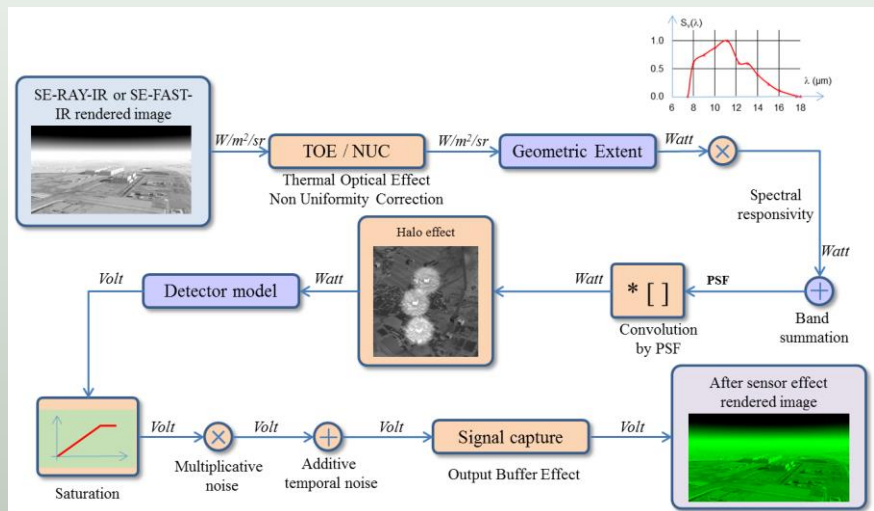
- 32 bits floating point computation
- Easy sensor parameterisation with C API
- Integrated into SE-TOOLKIT
- Delivered with 10+ tutorials
- Compatible with SE-RAY-IR and SE-FAST-IR computation
- Spectral optical effects
- Modelling of optical, spatial and electronic Modulation Transfer Functions (MTF)
- Various types of noises
- Blooming and persistence effects
- Halo effects
- Non-linear detector model
- Thermal Optical Effects

### Synthetic Image Generator System

The SE-IR-SENSOR library is compatible with both the non real-time (SE-RAY-IR) infrared physical computation and the real-time (SE-FAST-IR) graphic board rendering

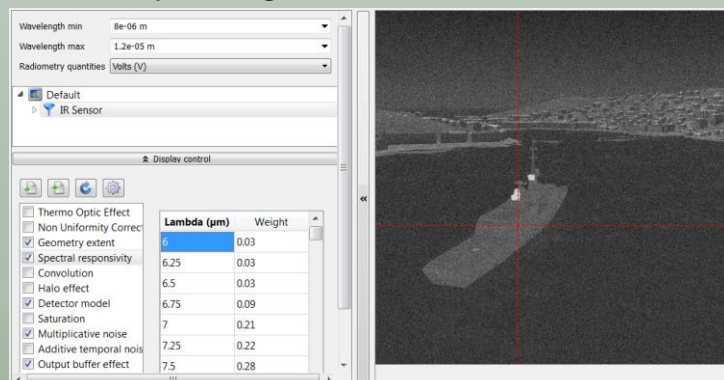
The image produced by a real sensor is altered by its optics, self-structure, electronics for acquisition and by the sensor carrier dynamics

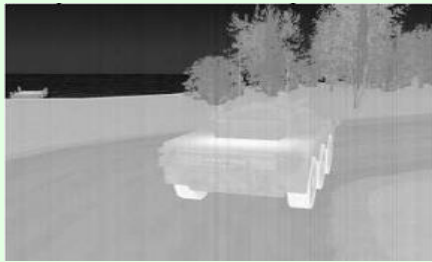
The SE-IR-SENSOR library simulates these disruptive components to obtain a realistic sensor signal



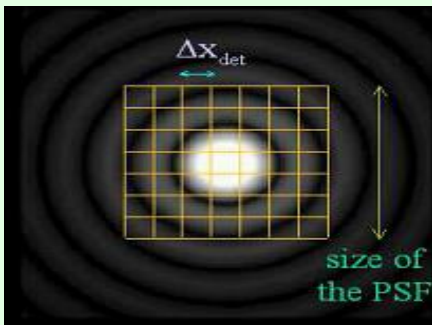
The sensor treatment pipe

Those features are accessible either through a Graphical User Interface (SE-SIGNAL-VIEWER) or using a C API





Scan line effect



Representation of the blur effect

## Flir Cameras effect

- SE-IR-SENSOR creates simulated images of FLIR Systems products. FLIR camera DATAsheets are integrated



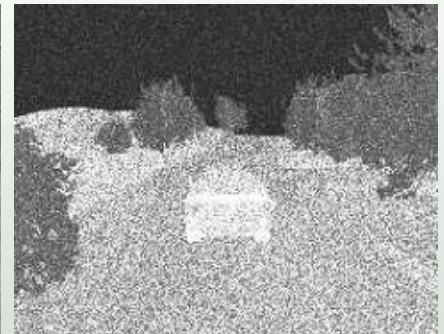
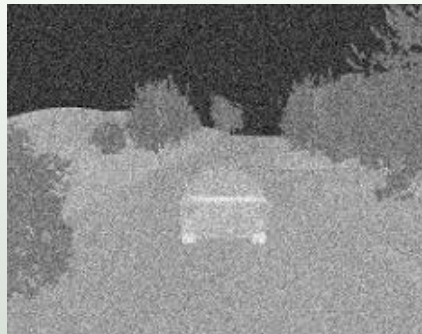
## System requirements



## Tutorials

SE-IR-SENSOR is delivered with a set of tutorials (including source code and documentation) that present case studies in terms of sensor effects modelling

- Scan Line Effect** : a micro bolometer can be used as an infrared radiation detector. SE-IR-SENSOR simulates the scan line effect present on the image
- Diffraction Effect** : because of light's wave nature, an optical system with a finite-sized aperture can never produce a perfect image. SE-IR-SENSOR simulates the diffraction effect through convolution matrices
- Histogram Equalization** : SE-IR-SENSOR computes the best Look Up Table that changes the value of each pixel of the image into a more appropriate value



## Sensor In Operation Effects

- Jitter Effect** : Sensor motion is often a major cause of image degradation. SE-IR-SENSOR simulates the image degradation in the case of sinusoidal vibrations at high vibration frequencies
- Blur Motion Effect** : Image quality is degraded when either the objects, either the image receiver or the optical-system line of sight move during an exposure. SE-IR-SENSOR simulates blur effect as a signal post treatment



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