# Towards a sensor for detecting human presence and characterizing activity (2011)

* Vision-based system for human detection and activity analysis in [indoor environment](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/indoor-environment)
* Video analysis, using a static camera
* Three main steps - change detection using a background model, moving objects tracking, based on interest points, and to know the nature of the various objects that could be present in the scene, the usage of multiple cascades of boosted classifiers
* Applications - occupancy and activity characterization (heating adjustment and demand-controlled ventilation, security and [energy efficient buildings](https://www.sciencedirect.com/topics/engineering/energy-efficient-building)).
* Reaching the Next Level of Indoor Human Presence
* Detection: An RF Based Solution
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* Detection: An RF Based Solution

# Reaching the Next Level of Indoor Human Presence Detection: An RF Based Solution (2013)

* a novel
* human presence detection method based on information entropy
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* human presence detection method based on information entropy
* A novel human presence detection method based on information entropy extracted from a sequence of received signal strength
* Solely based on radio irregularity phenomenon
* Introduction of an additional level of sensor intelligence without sensor and installation costs or the need for training

# Radar-Based, Simultaneous Human Presence Detection and Breathing Rate Estimation

* Human detection presence using only the minute movements of breathing
* Extraction of the suspected breathing signal, and construction of its Fourier series (FS) equivalent.
* Use of a generalized likelihood ratio test (GLRT) on the FS signal to determine if it is a breathing pattern or noise
* Test population – sleeping babies and humans aged 12 to 44 sitting on a chair in front of a radar
* Zero false alarms and zero misses for eight nights of baby sleeping tests

# Human Presence Detection with Thermal Sensor using Multilayer Perceptron Algorithm (2021)

* A low-profile IoT platform to detect the human presence using the OMRON D6T-44L06 thermal sensor
* Prototype built over ATmega328P microcontroller based board, Audino Nano
* Experimentation in three phases—first, implementing the hardware for the dataset preparation, second, creating a model for Artificial Neural Network (ANN) (by Multilayer Perceptron Algorithm) and third, deploying the trained model to the Audino Nano for practical validation.
* Prototype - used for logging data in the presence and absence of humans using the thermal sensor
* Multilayer Perceptron model - trained using the Tensorflow library in python
* Realized and trained model has an efficiency of 99.6%

# A Non-Intrusive Human Presence Detection Methodology Based on Channel State Information of Wi-Fi Networks (2023)

* Non-intrusive human presence detection system
* Detection of human presence based on the channel state information (CSI) of wireless communication networks
* Methodology - based on features in time-domain
* 802.11n standard - Multiple-input multiple-output (MIMO) with orthogonal frequency division multiplexing (OFDM)
* An average accuracy above 90%
* System limitations - Only able to detect one intrusion at a time, and not able to distinguish whether the intrusion has been caused by one or several people

**WiFi-based non-contact human presence detection technology (2024)**

* Non-contact human presence detection approach based on Wifi
* Pre-processing of Channel State Information (CSI) followed by feature extraction and classification
* Accurate perception and human presence recognition – Due to signal models corresponding to varying states
* Sensing accuracy upto 99%

# Time-Selective RNN for Device-Free Multi-Room Human Presence Detection Using WiFi CSI

# WiFi-based passive sensing system for human presence and activity event classification

#### **A Novel Infrared (IR) Based Sensor System for Human Presence Detection in Targeted Locations**

# An Ultrasonic Sensor for Human Presence Detection to Assist Rescue Work in Large Buildings

# Human presence and motion detection through electrostatic sensing

# Human Presence Detection Using Ultrashort-Range FMCW Radar Based on DCNN

**Hidden Markov models for presence detection based on CO2 fluctuations**

# Human detection in surveillance videos and its applications - a review