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Iniziato	lunedì, 16 maggio 2022, 10:58
Stato	Completato
Terminato	lunedì, 16 maggio 2022, 11:04
Tempo impiegato	5 min. 52 secondi
Punteggio	3,00/10,00
Valutazione	**9,00** su un massimo di 30,00 (**30**%)

Domanda 1

Risposta errata

Punteggio ottenuto 0,00 su 1,00

The false positive identification rate of a system:

- ○ a. Depends on the biometric traits.
- ○ b. Increases with the number of templates in the system.
- ○ c. None of the above
- ○ d. Depends on the sensor used for the capture.
- ● e. It's not related with the number of users. ✖

La risposta corretta è: Increases with the number of templates in the system.

Domanda 2

Risposta
corretta

Punteggio
ottenuto 1,00
su 1,00

In a face recognition system based on a CCTV camera, the minimum camera resolution required for the identity identification depends on:

- ○ a. The camera resolution and the size of the scene ✔
- ○ b. Only the camera resolution
- ○ c. Only the technology of the image sensor, i.e. if is a CCD or a CMOS camera
- ○ d. None of the above
- ○ e. Only the size of the scene

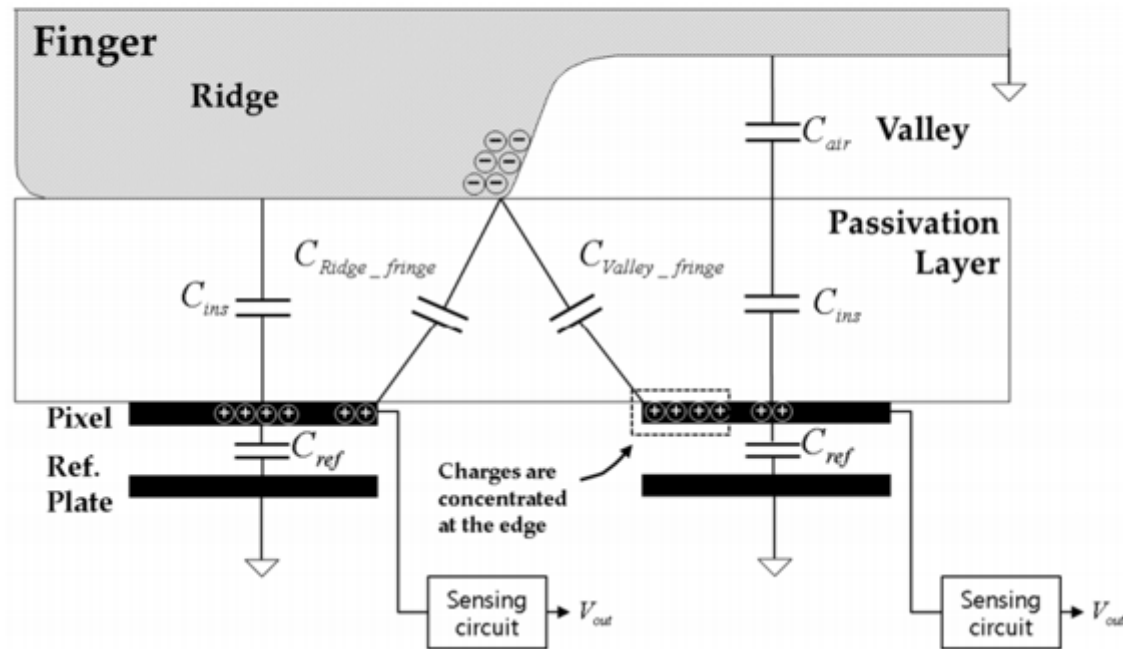La risposta corretta è: The camera resolution and the size of the scene

In capacitive sensors, the difference DC between the pixel capacitances at ridges and valleys is improved by:

$$\Delta C = C_{RidgeTot} - C_{ValleyTot}$$

a. Increasing the thickness of the passivation layer

b. Increasing the metal plate of the pixel

c. Increasing the capacitance of the passivation layer (Cins)

d. Decreasing the thickness of the passivation layer

e. Decreasing the capacitance difference between C $Ridge\_fringe$ and C $Valley\_fringe$

La risposta corretta è: Decreasing the thickness of the passivation layer

In optical fingerprint sensors, what is the component which converts the energy of the light that hits the detector into electric charge?

- a.   TIR LEDs
- ● b.   Photodiodes or Phototransistors   ✔
- c.   The sheet prism
- d.   The Fiber optic Plate (FOP)
- e.   The imaging polarizer

La risposta corretta è: Photodiodes or Phototransistors

The quantum efficiency of a photo-sensitive sensor working in the visible spectrum is:

- a.   None of the above answer is correct
- ● b.   The percentage of electron-hole pairs converted into photons   ✘
- c.   Independent from the wavelength of the incident light
- d.   Independent on the photo-sensitive material of the sensor, e.g. Si, and InGaAs.
- e.   Reduced in the wavelength range between 350 nm and 850 nm
- f.   Higher in back-illuminated sensors than conventional front-illuminated sensors

La risposta corretta è: Higher in back-illuminated sensors than conventional front-illuminated sensors

Which of the following statement is true about CMOS and CCD cameras?

- a. In both CMOS and CCD camera, the photo-generated charge is firstly transferred to read-out registers and then ✖
  converted to voltage signal
- b. In both CMOS and CCD camera, the photo-generated charge is firstly converted into a voltage signal and then the
  voltage signal is transferred
- c. In CCD cameras, the photo-generated charge is firstly converted into a voltage signal and then the voltage signal is
  transferred; in CMOS cameras, the photo-generated charge is firstly transferred to read-out registers and then
  converted to voltage signal
- d. In CMOS cameras, the photo-generated charge is firstly converted into a voltage signal and then the voltage signal is
  transferred; in CCD cameras, the photo-generated charge is firstly transferred to read-out registers and then
  converted to voltage signal

La risposta corretta è: In CMOS cameras, the photo-generated charge is firstly converted into a voltage signal and then the
voltage signal is transferred; in CCD cameras, the photo-generated charge is firstly transferred to read-out registers and then
converted to voltage signal

Which of the following statements is false about performance factors of array-pixel based fingerprint sensors?

- a. The dynamic gray range may be equal or lower than the maximum gray-quantization levels
- b. The output resolution is always identical to the sensor resolution
- c. The number of pixels of a square shaped sensor can be retrieved by knowing the resolution and the sensitive area
- d. The gray-level quantization is the maximum number of gray-levels and is related to the number of bits of the A/D ✖
  converters

La risposta corretta è: The output resolution is always identical to the sensor resolution

An active thermal fingerprint scanner based on a pyroelectric sensor acquires the fingerprint pattern:

- ○ a. By applying a sinusoidal low-power heat, which generates an higher heat variation at ridges than at valleys
- ○ b. By applying a low-power heat pulse, which generates an higher heat variation at valleys than at ridges
- ○ c. By applying a low-power heat pulse, which generates an higher heat variation at ridges than at valleys
- ◉ d. By measuring the increase of temperature induced by the body temperature on the pixels in contact with ridges ✖
- ○ e. By applying a triangular low-power heat, which generates an higher heat variation at ridges than at valleys

La risposta corretta è: By applying a low-power heat pulse, which generates an higher heat variation at valleys than at ridges

Domanda **9**

Risposta
corretta

Punteggio
ottenuto 1,00
su 1,00

Which of the following statement is true about CCD and CMOS cameras?

- ○ a. In CMOS camera, the photoelectric effect induces the recombination of e-h pairs in the potential well of a MOS capacitor
- ○ b. In CMOS camera, the photoelectric effect induces the generation of e-h pairs in the potential well of a MOS capacitor
- ◉ c. In CCD camera, the photoelectric effect induces the generation of e-h pairs in the potential well of a MOS ✔ capacitor
- ○ d. None of the above answer is correct
- ○ e. In CCD camera, the photoelectric effect induces the recombination of e-h pairs in the potential well of a MOS capacitor

La risposta corretta è: In CCD camera, the photoelectric effect induces the generation of e-h pairs in the potential well of a MOS capacitor

In optical fingerprint scanners based on optical fiber plates:

- ○ a. None of the above answers are correct
- ◉ b. The fabrication cost is lower than prism-based scanners, thanks to the limited area of the CCD/CMOS imaging sensor and low cost of optical fibers ✖
- ○ c. The optical fibers are used to transmit the digital data from the sensor to the processing unit
- ○ d. The optical fibers are used to multiply the light (photomultiplication) and decrease the contrast between the ridges and valleys
- ○ e. The optical fibers are used as light-sensitive imager through the electroluminescence phenomena
- ○ f. The fingerprint image can be acquired in dark environments without external and internal light source

La risposta corretta è: None of the above answers are correct

◀ Lecture 20- Performance factors of biometric scanners

Vai a...

2021/22 Biometrics - Lesson 20 ▶

DOCUMENTAZIONE

Moodle

Kaltura