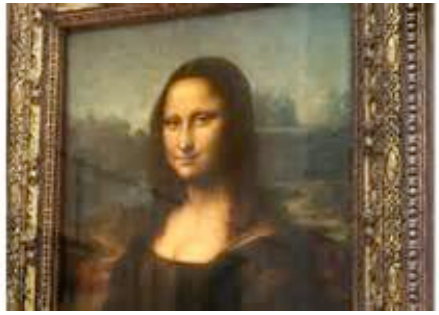
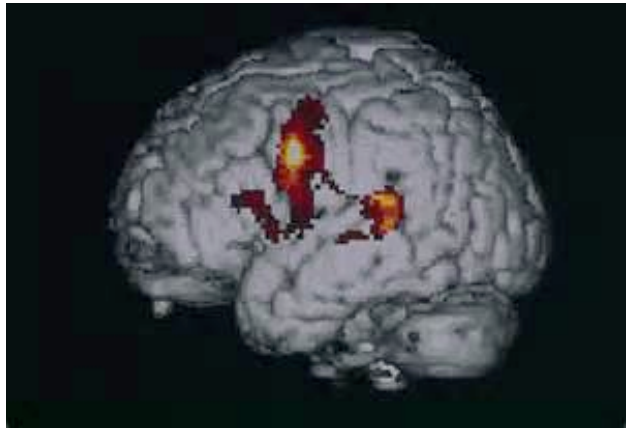
Image …

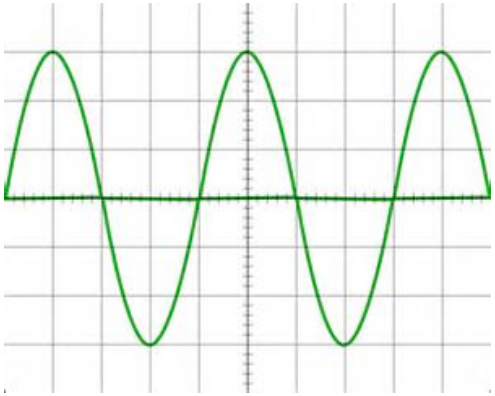
- Représentation 2D d'une information
- continue, dimensions, précision







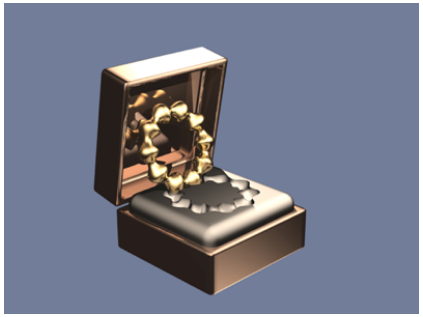
- créée, calculée, acquise, …
- perçue, affichée, …



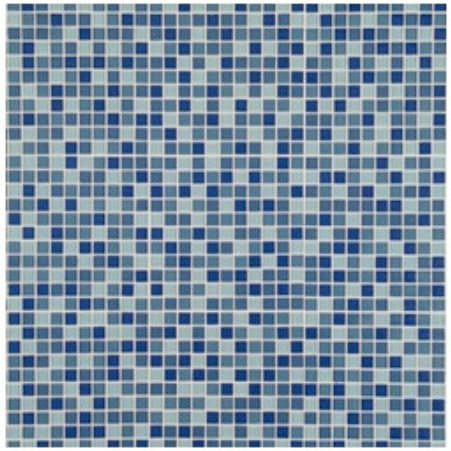
Images numériques

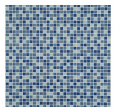
- Profondeur : noir et blanc, niveau de gris, couleur, intensité …






- Définition / résolution





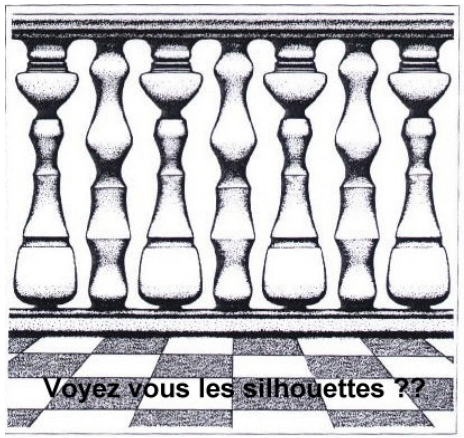
- Ecrans, repères, fichiers, …

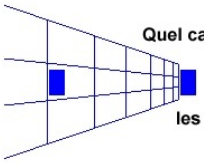
Perception visuelle

- L'oeil et le système visuel



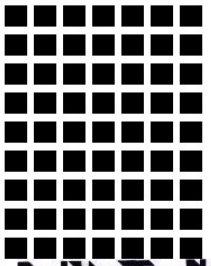
Interprétation





Quel carré est le plus grand .....

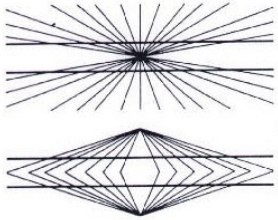
les deux sont pareils !!!



Vous voyez des points entre les carrés ????

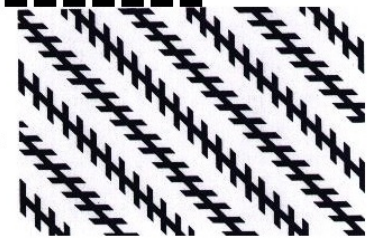
.....

Pourtant ils n'existent pas !!!



Même si votre oeil vous dit le contraire .....

les axes sont parallèles !!

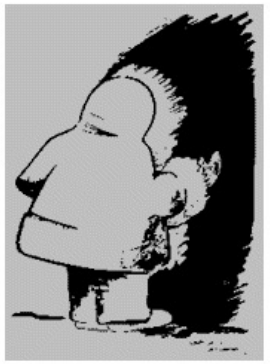




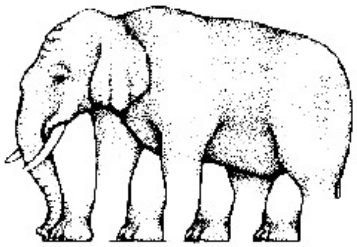
Une vieille .....
et une jeune .....



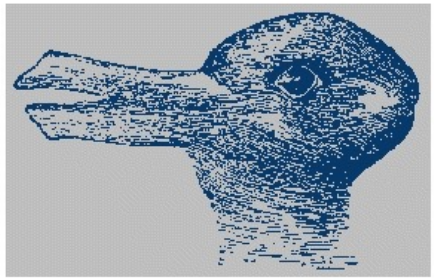
Une jeune .....
un homme .....
et une vielle ...



Un esquimaud ....
et un indien ....



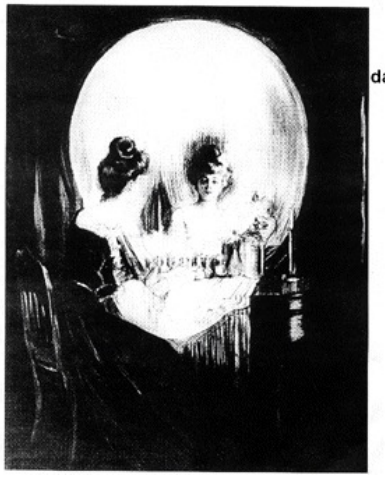
no comment



Canard ou lapin ???



Vous le voyez ?????
.... c'est Jésus ...

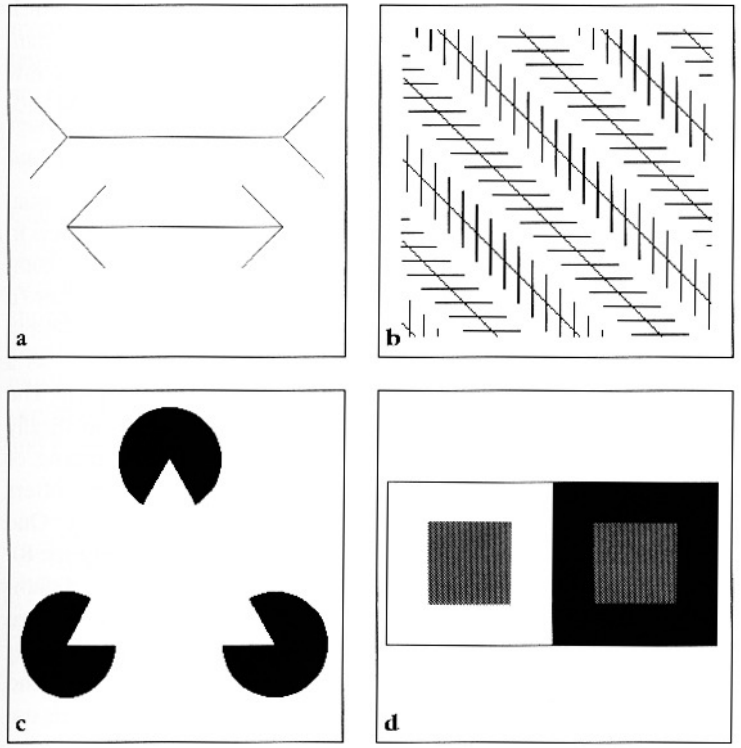


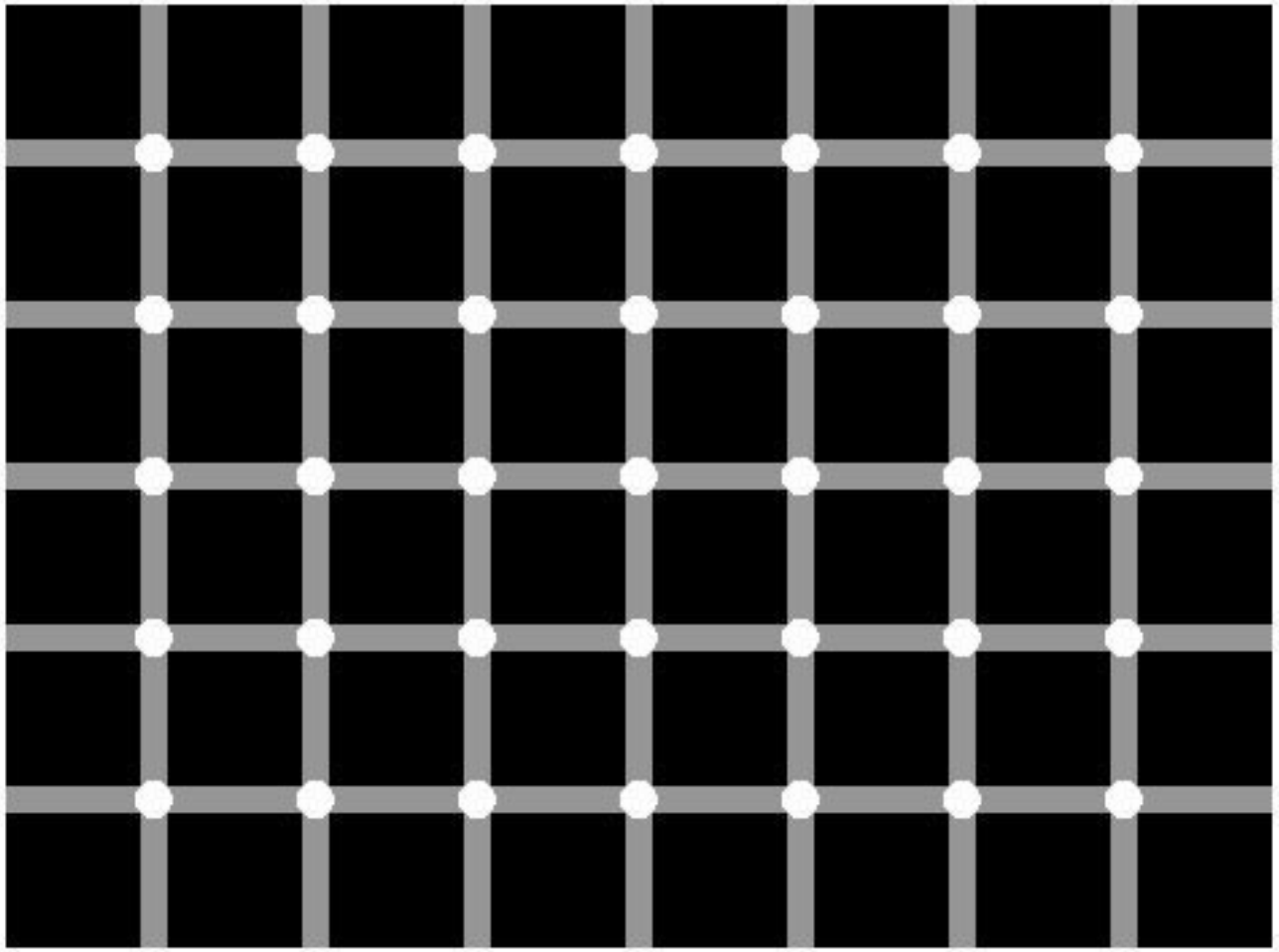
Que se cache t-il
dans cette tête de mort ???

Des tâches, oui,
mais aussi un mot ...

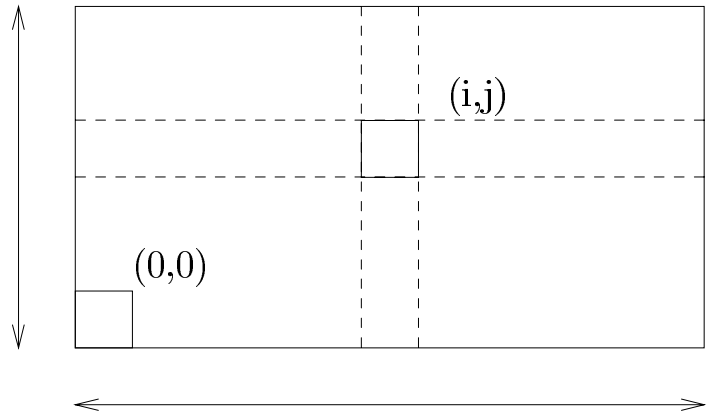


Trois personnes en tout,
c'est très subtil !!!!

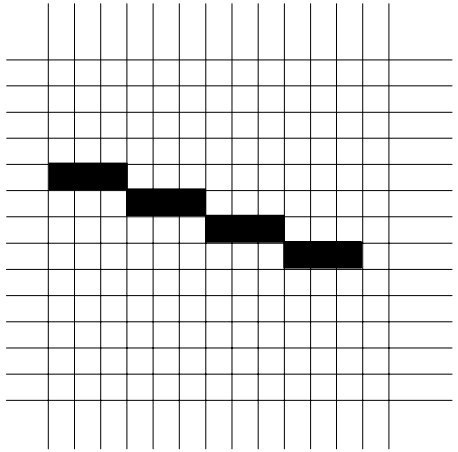




Surface «discrète»





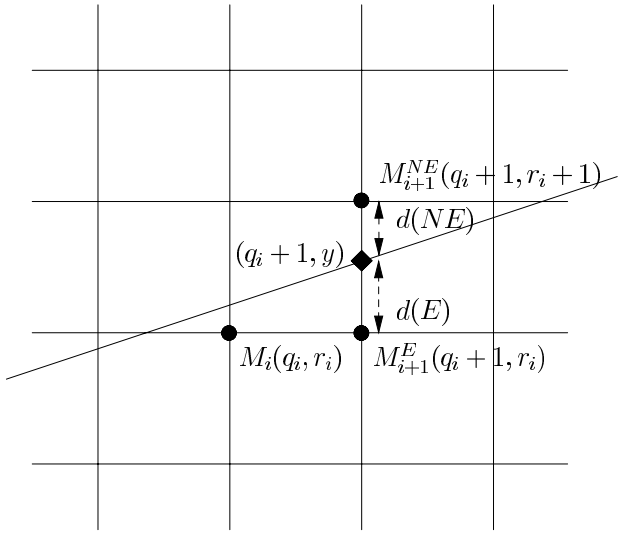


Tracés élémentaires

Segment

- A(Ax,Ay) – B(Bx,By).
- Pente : Dy/Dx (< ou > 1)
- Naïf
- incrémental
- …

Segment de Bresenham



- Calculer la distance à la courbe et choisir le plus près.

$$\begin{aligned} d(M_{i+1}^{NE}) &= (r_i+1) - y \\ d(M_{i+1}^{E}) &= y - r_i \end{aligned}$$

$$\begin{aligned} y - r_i - (r_i+1) + y &< 0 \\ 2(y - r_i) - 1 &< 0 \\ 2((q_i+1)\frac{\Delta y}{\Delta x} - r_i) - 1 &< 0 \\ 2(q_i\Delta y - r_i\Delta x) + 2\Delta y - \Delta x &< 0 \end{aligned}$$

- Points candidats
- NE ou E

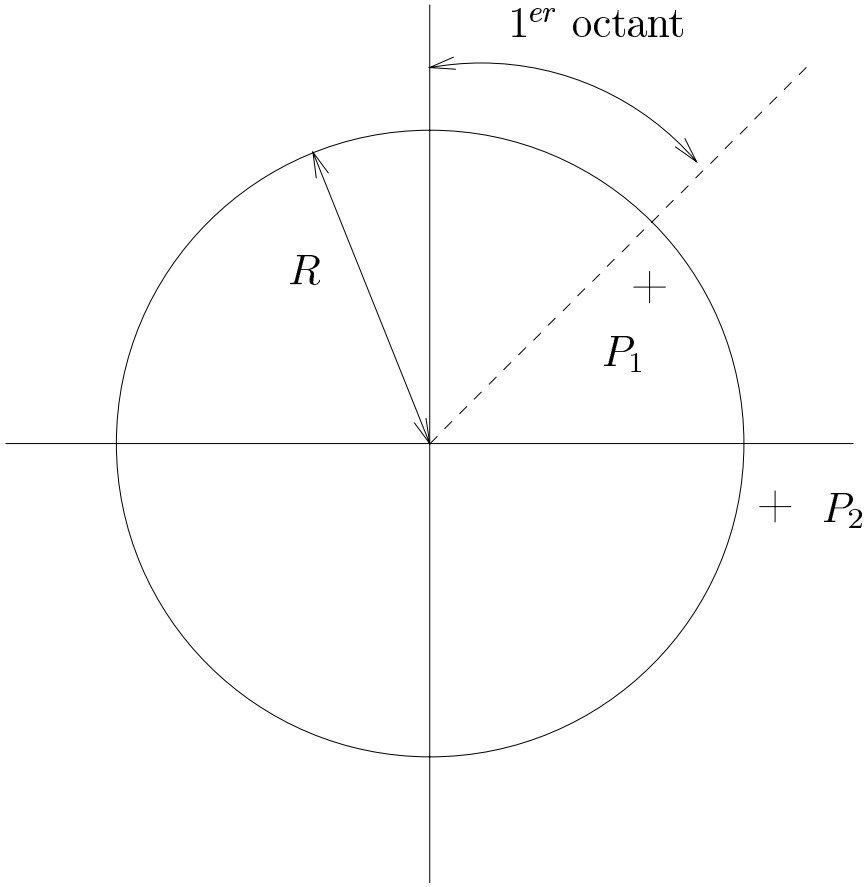
$$\begin{cases} C_{i+1}(q_i+1, r) &= 2((q_i+1)\Delta y - r_i\Delta x) + 2\Delta y - \Delta x \\ &= C_i(q_i, r_i) + 2\Delta y \\ C_{i+1}(q_i+1, r_i+1) &= 2((q_i+1)\Delta y - (r_i+1)\Delta x) + 2\Delta y - \Delta x \\ &= C_i(q_i, r_i) + 2\Delta y - 2\Delta x \end{cases}$$

$$M_{i+1}^{E} \begin{cases} q_{i+1} = q_i + 1 \\ r_{i+1} = r_i \end{cases} \qquad M_{i+1}^{NE} \begin{cases} q_{i+1} = q_i + 1 \\ r_{i+1} = r_i + 1 \end{cases}$$

Segments

- Méthode de Lucas
- Méthode de Réveilles
- Calcul de la période ...

Cercle de Bresenham



- Points candidats
- SE ou E

$$M_{i+1}^{E} \begin{cases} q+1 \\ r \end{cases} \qquad M_{i+1}^{SE} \begin{cases} q+1 \\ r-1 \end{cases}$$

$$\begin{cases} d(E) &= (q+1)^2 + r^2 - R^2 \\ d(SE) &= (q+1)^2 + (r-1)^2 - R^2 \end{cases} \qquad \begin{aligned} C(q,r) &= (q+1)^2 + r^2 - R^2 + (q+1)^2 + (r-1)^2 - R^2 \\ &= 2(q+1)^2 + 2r^2 - 2r + 1 - 2R^2 \end{aligned}$$

Si M_{i+1}^{E} est choisi :

$$\begin{aligned} C(q+1,r) &= 2(q+2)^2 + 2r^2 - 2r + 1 - 2R^2 \\ &= C(q,r) + 4q + 6 \end{aligned}$$

Si M_{i+1}^{SE} est choisi :

$$\begin{aligned} C(q+1,r-1) &= 2(q+2)^2 + 2(r-1)^2 - 2(r-1) + 1 - 2R^2 \\ &= C(q,r) + 4q + 6 + 2 - 4r + 2 \\ &= C(q,r) + 4q - 4r + 10 \end{aligned}$$