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VARIOUS FIELDS USING MACHINE LEARNING

- Neuroscience
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HISTORY OF COMPUTER VISION

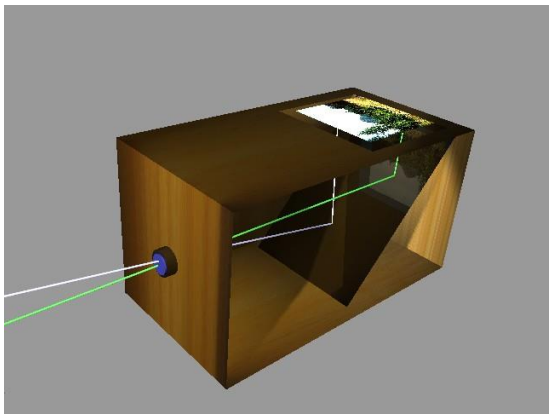
2.1 Evolutions big bang

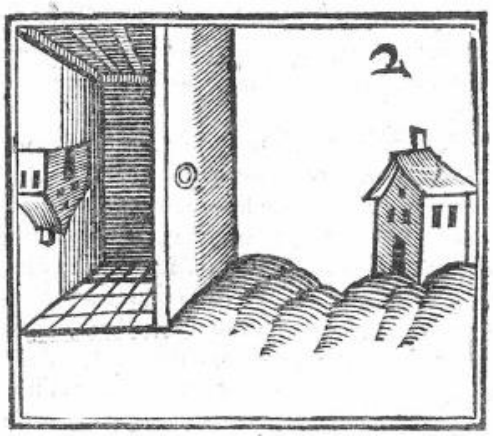
Year: 543 million years agoScientist: Andre parker

The sudden appearance of range of animals during big bang evolution was due to the development of vision. Due to vision led to development of hard body parts.

2.2 Camera obscura

Natural phenomena occurs when an image in a screen was projected by inverted and reversed on other end through a small hole in screen.





Scientist history

- Gemma frisius – 1545
    - Is a mathematician who created globes, applied his improved mathematics in surveying and navigation
- Leonardo da Vinci – 16th Century
    - He is an Italian interested in invention, drawing, painting, sculpture, architecture, science, music, mathematics, engineering, literature, anatomy, geology, astronomy, botany, paleontology and cartography. He was greatest painter.

2.3 Study of vision

Year: 1959

Search value: Study of vision Hubel and Wiesel

Link: https://www.youtube.com/watch?v=Cw5PKV9Rj3o

https://www.youtube.com/watch?v=IOHayh06LJ4

Authors: David Hubel and Torstein Wiesel

They study based on cat retina, as they moved bright line across retina.

They noticed that

1. Neurons fires only when line was perpendicular to retina.
2. The activity of these neurons changed depending on the orientation of the line.
3. Sometimes neurons fires only when line was moving in a particular direction.

Simple cells – Response to light orientation

Complex cells - Response to light orientation and other

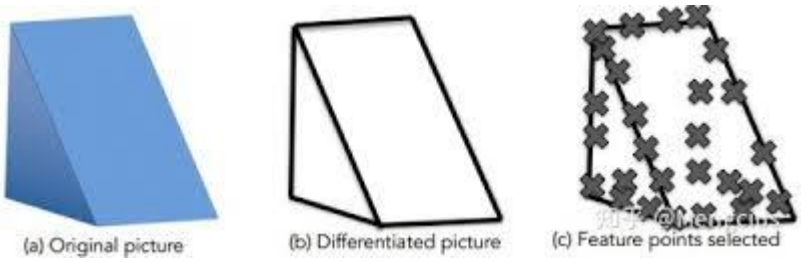
Hyper complex cells - Response to movement with an end point

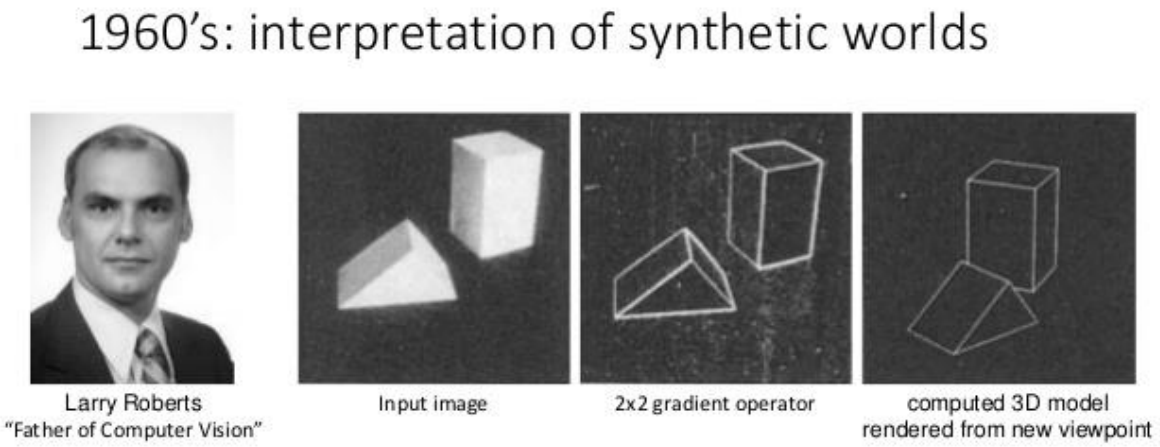
2.4 Block world

Year: 1963

Author: Larry Roberts

Considered as first PhD in computer vision algorithm where visual world simplified into Geometrical space. Tried to make 3D geometry by arrangements of blocks





2.5 Summer vision Project

Year: 1966

Author: MIT

The goal was to summer workers effectively in the construction of significant part of a visual system.

Field: Pattern recognition.

David Marr (MIT – Computer vision scientist)

Steps

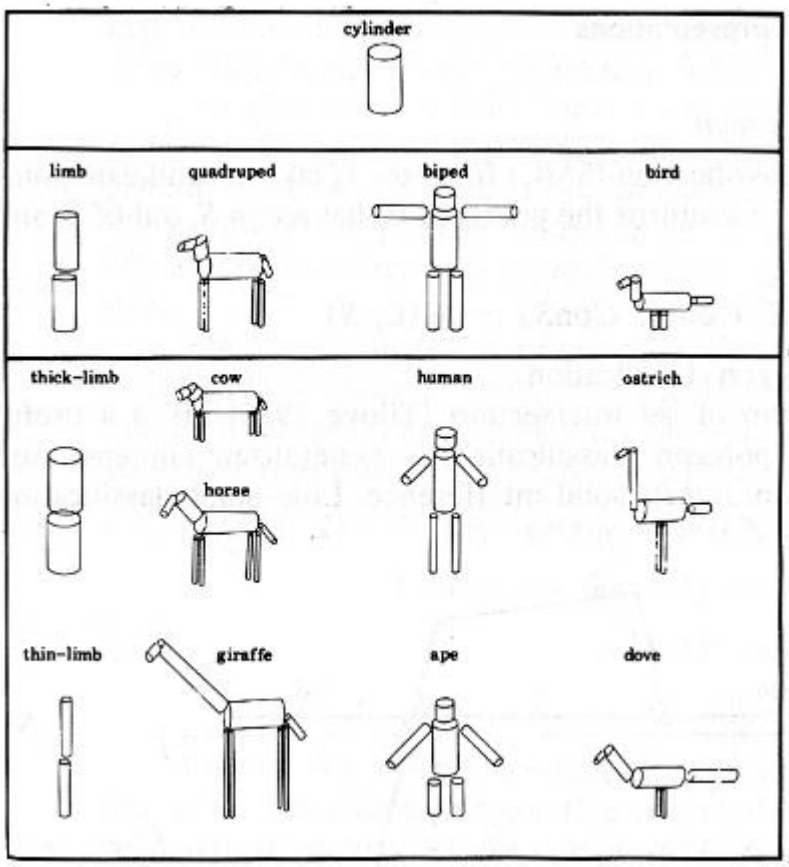
1. Input image
2. Edge Images
    a. Blobs, edges, ends, lines etc.
3. 2 1/2 – D Sketch
    a. Place all together to form a surface, discontinued.

2.6 Generalized Cylinder structure VS Picture structure

Generalized structure

Author: Brooks and Binford 1979

Link : http://homepages.inf.ed.ac.uk/rbf/BOOKS/BANDB/LIB/bandb9_34.pdf



Picture structure

Author: Fischler and Elschlager