

U1. Introduction

SJK002 Computer Vision

Master in Intelligent Systems



- Definitions.
- Application fields.
- Human vs artificial vision.

Computer vision

- **Artificial Intelligence** requires:
 - • Perception
 - • Knowledge/Reasoning
 - • Action
- **Computer Vision:**

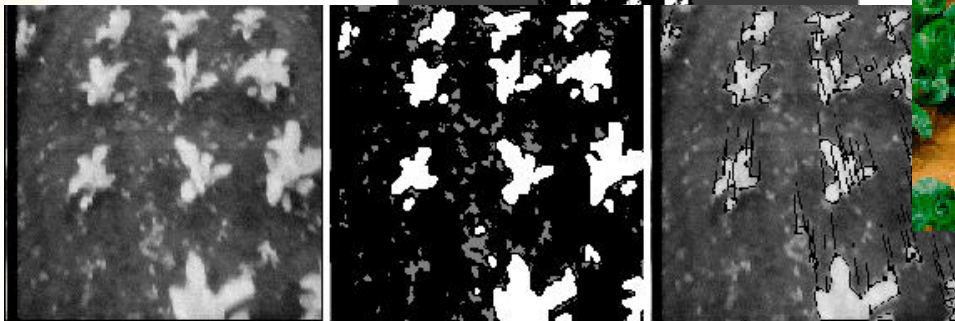
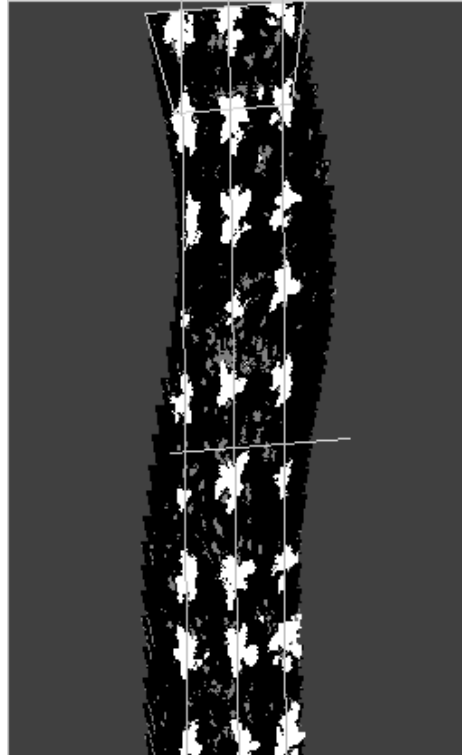
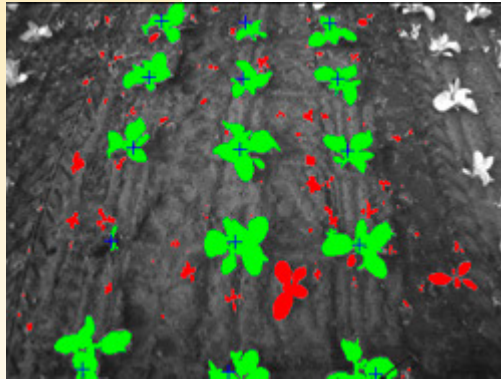
“Studies scene interpretation from 2D projections of sensors without contact connected to a computer system.”
- **Concepts related to Computer Vision:**
 - Digital image processing/analysis.
 - Artificial vision.
 - Industrial vision.

Relations with other fields

- **Computer graphics:**
 - Inverse process.
 - It is becoming more related.
- **Pattern Recognition / Machine Learning:**
 - Classification of numerical and symbolic data.
 - Parts of PR / ML in the visual process.
 - Scene interpretation.
- **Artificial Intelligence:**
 - Perception, knowledge/reasoning and action.
 - Part of perception processes.
- **Psico-physics:**
 - Relationship with human vision.

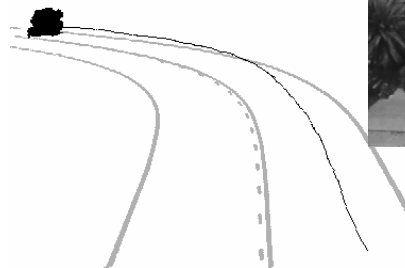
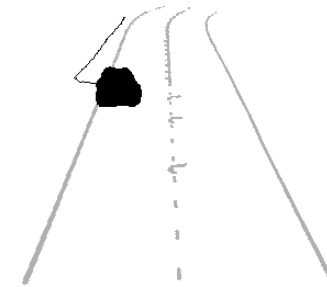
Applications

- Agriculture:
 - Guiding of vehicles.
 - Tasks automation.



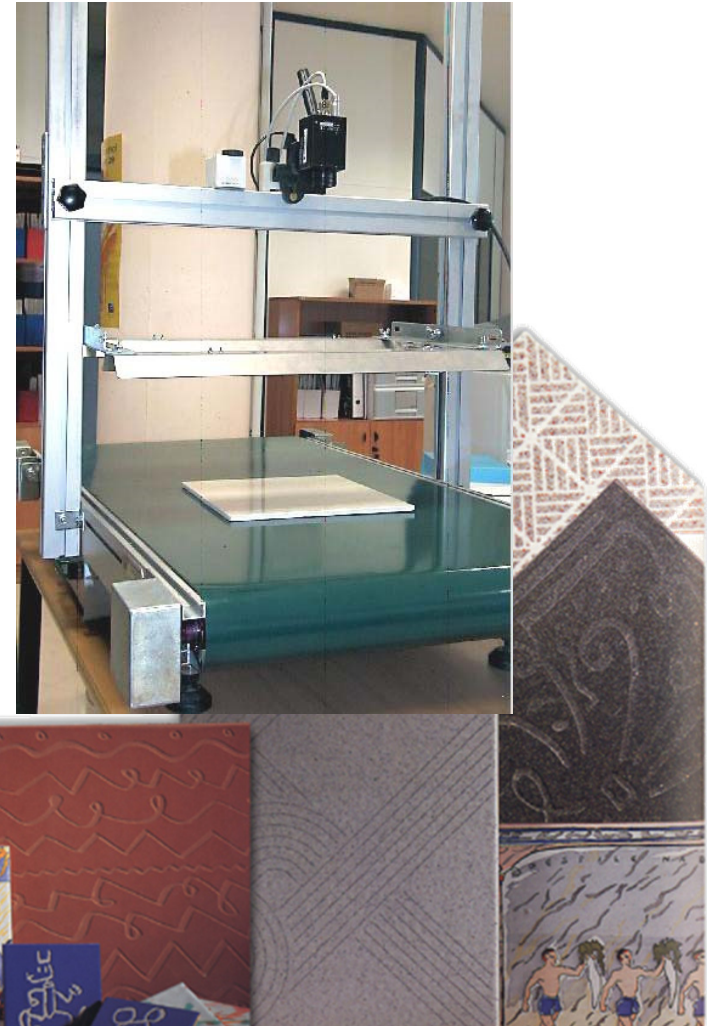
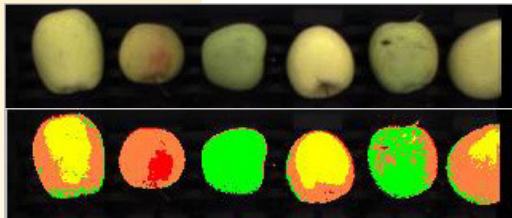
■ Control of vehicles and traffic:

- Vehicles flow.
- Study of trajectories.
- Event detection.

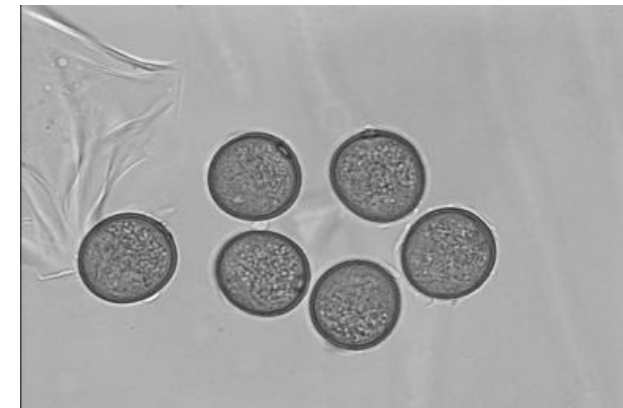


■ Visual inspection in industry:

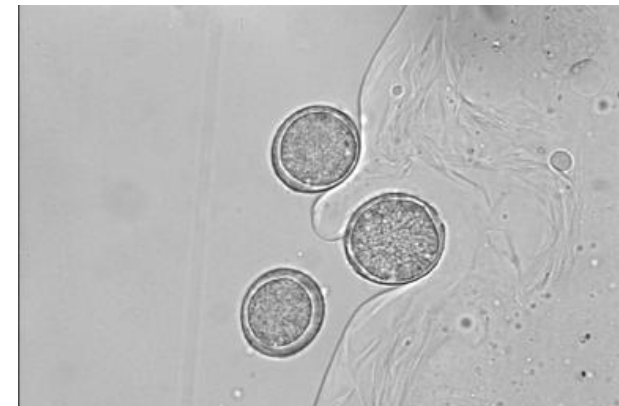
- Tiles
- Agro-food
- Electronics
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- Biomedical:
 - Pollen recognition.
Measuring content in air pollution analysis.
 - ...

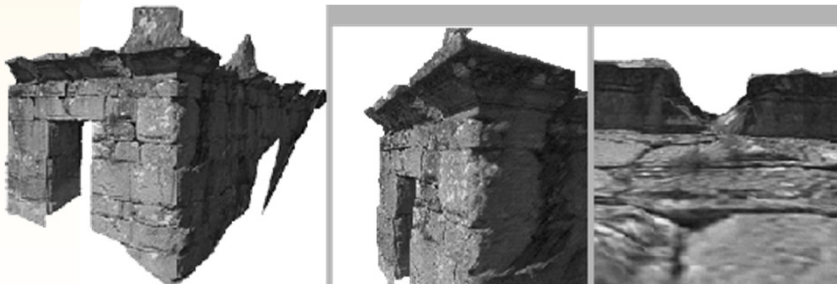


Gramínea

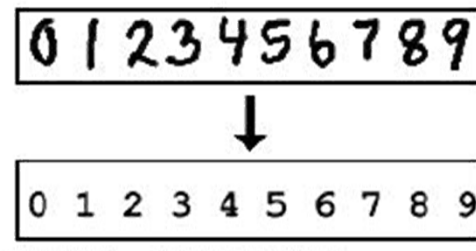


Olmo

- Architecture: 3D Models/Reconstruction:
 - Stereo vision.
 - Image sequences: video.

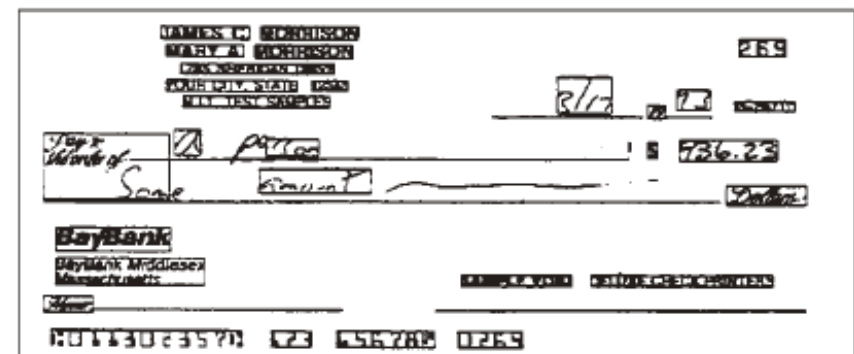
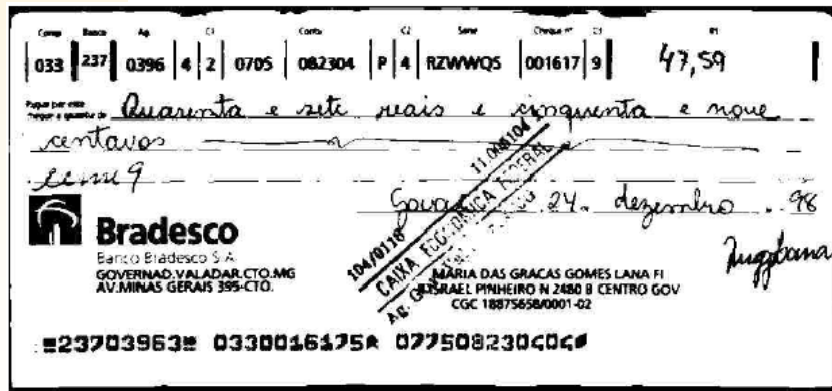
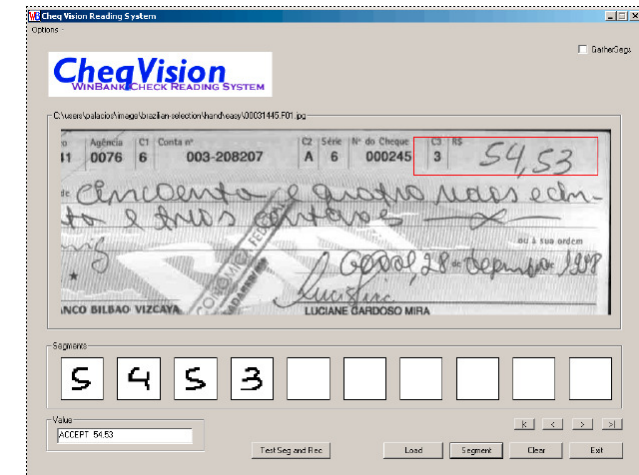


■ Optical Character Recognition (OCR):



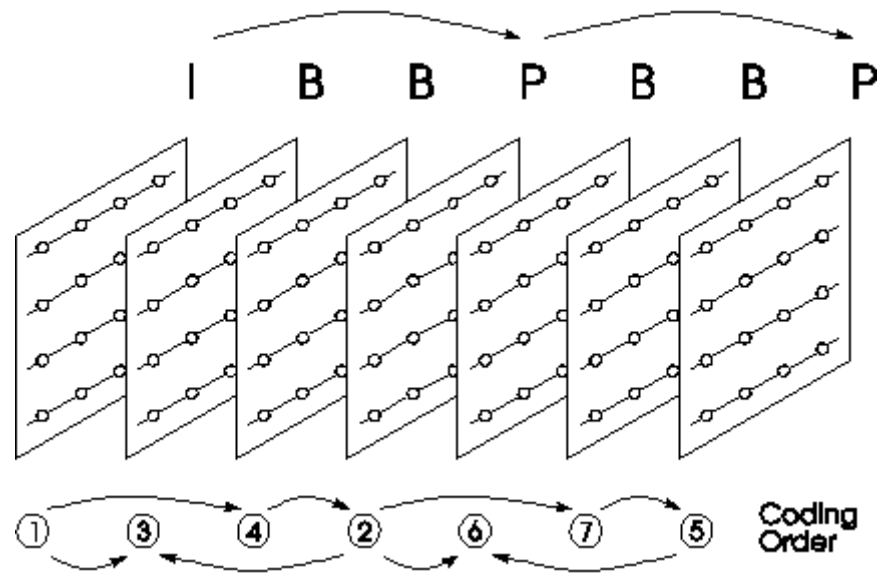
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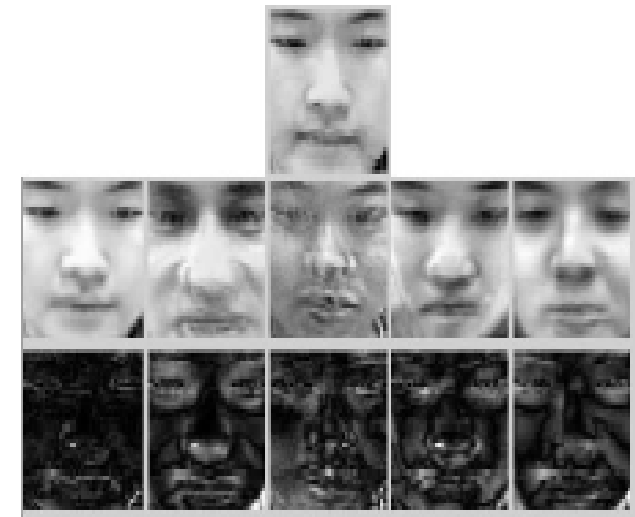


Tratamiento de cheques de banco

- Video coding/compression.

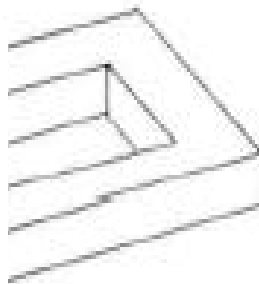
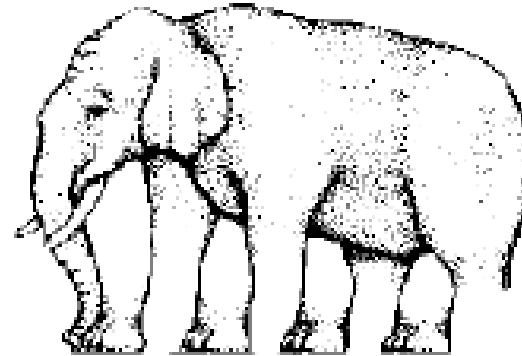
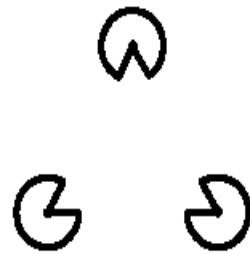


- People security/control:
 - Face recognition.
 - People counting.
 - Tracking and identifying behaviours.

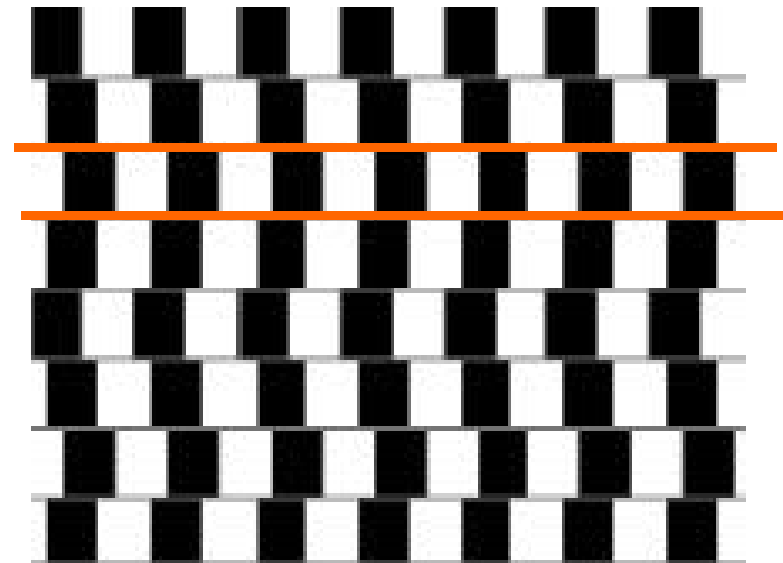
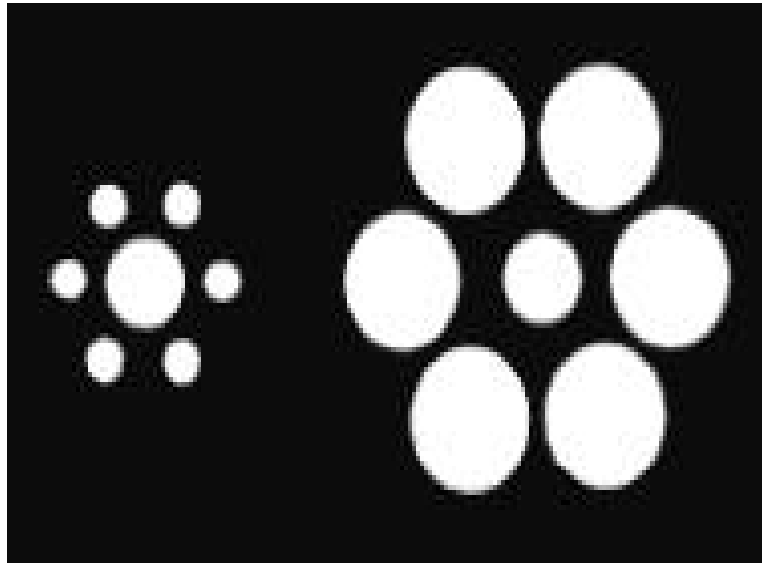


Do we see what we watch or what we want to?

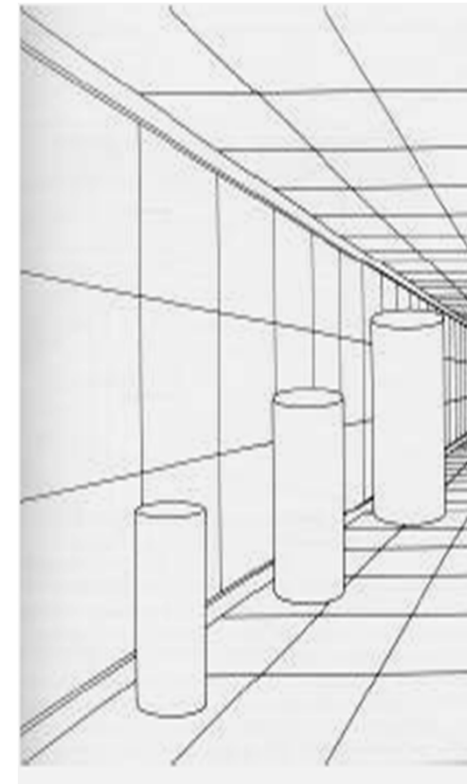
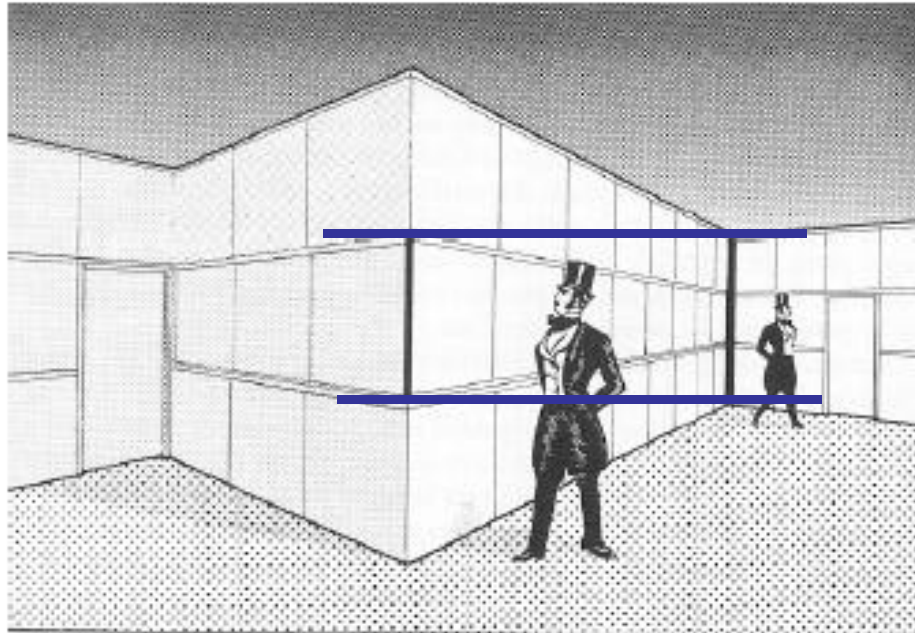
- The concept of “object”



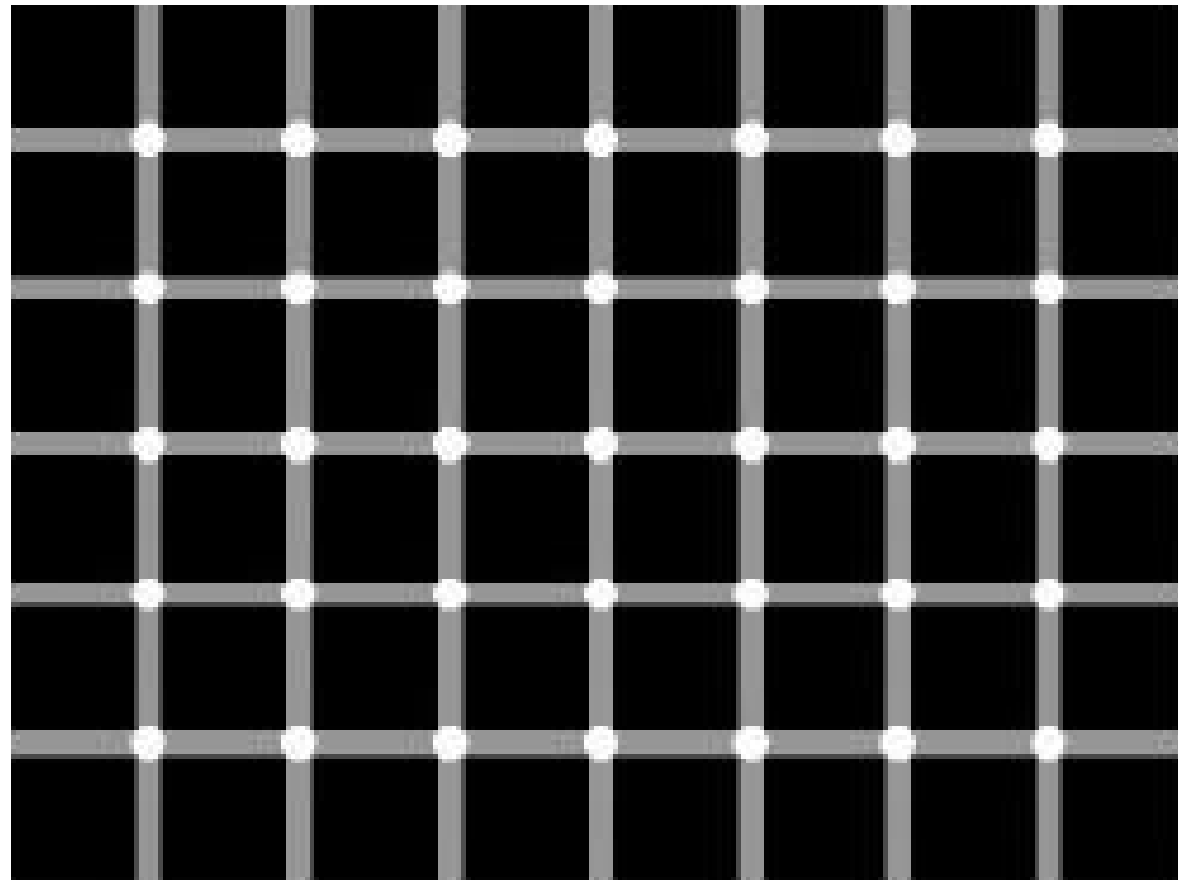
Human vision: difficulties to measure



Context influence



Optical illusions



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