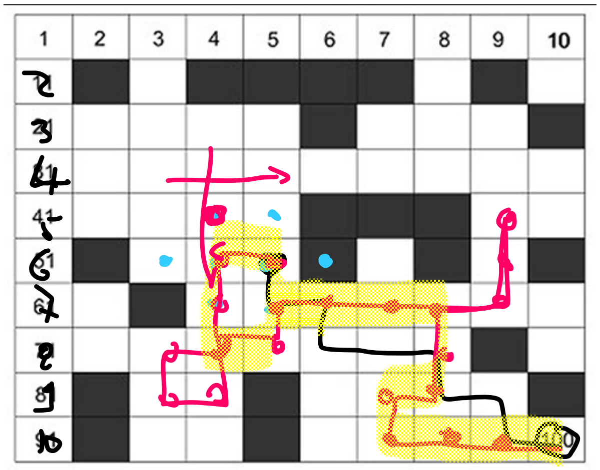
Εύρεση διαδρομής με τον αλγόριθμο ACO (ant colony optimization)



$$P_{ij}^{k}(t) = \begin{cases} \dfrac{(\tau_{ij}(t))^{\alpha} \cdot (\eta_{ij}(t))^{\beta}}{\sum_{s \in allow_k} (\tau_{is}(t))^{\alpha} \cdot (\eta_{is}(t))^{\beta}} & s \in allow_k \\ 0 & s \notin allow_k \end{cases}$$

$$\eta_{ij}(t) = \frac{1}{d_{ij}}$$

$$d_{ij} = \sqrt{(x_j - x_i)^2 + (y_j - y_i)^2}$$

$\tau_{ij}(t) \equiv$ ΠΟΣΟΤΗΤΑ ΦΕΡΟΜΟΝΗΣ ΣΤΟ ΚΕΛΙ i,j ΤΗΝ ΧΡΟΝΙΚΗ ΣΤΙΓΜΗ t

(5,6) → (4,6) ...

ΠΩΣ ΑΛΛΑΖΕΙ Η ΦΕΡΟΜΟΝΗ;

$$\tau_{ij}^{(t+1)} = (1-\rho)\,\tau_{ij}^{(t)} + \Delta\tau_{ij}^{(t)}$$

$0 < \rho < 1$

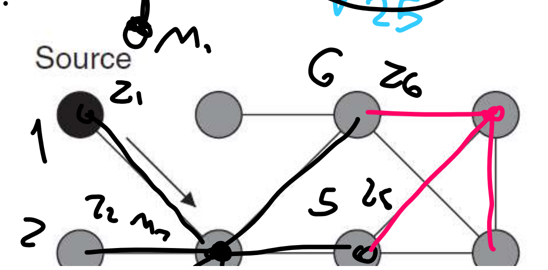
$$\Delta\tau_{ij} = \sum_{k=1}^{m} \Delta\tau_{ij}^{(k)}$$

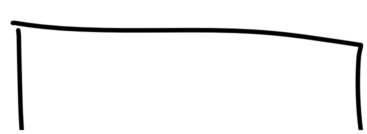
m: αριθμός μυρμ.

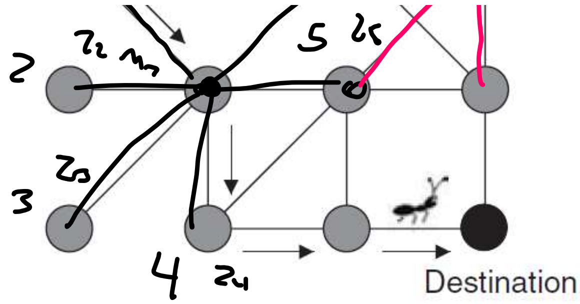
$$\Delta\tau_{ij}^{(k)} = \frac{Q}{L_m}$$

$Q \rightarrow 10$, $L_m \rightarrow 25$

L_m → ΣΥΝΟΛΙΚΟ ΜΗΚΟΣ ΜΟΝΟΠΑΤΙΟΥ







$$P_1 = \frac{z_1^{\alpha} \cdot \eta_1^{\beta}}{\sum r_i}$$

$r_1 = z_1^{\alpha} \, \eta_1^{\beta} \; . \; .$

$r_2 = z_2^{\alpha} \, \eta_1^{\beta}$

$\vdots$

$r_6 = z_6^{\alpha} \cdot \eta_6^{\beta}$

First node to scan

Scanning direction

0 - 1 - 3 - 4 - 5 - 3 - 2 - 8 - 5 - 6 - 9

Source

Destination

⋮

Scanning for node 3

First occurrence of node 3 when scanning from destination node

0 - 1 - 3 - 4 - 5 - 3 - 2 - 8 - 5 - 6 - 9

Source

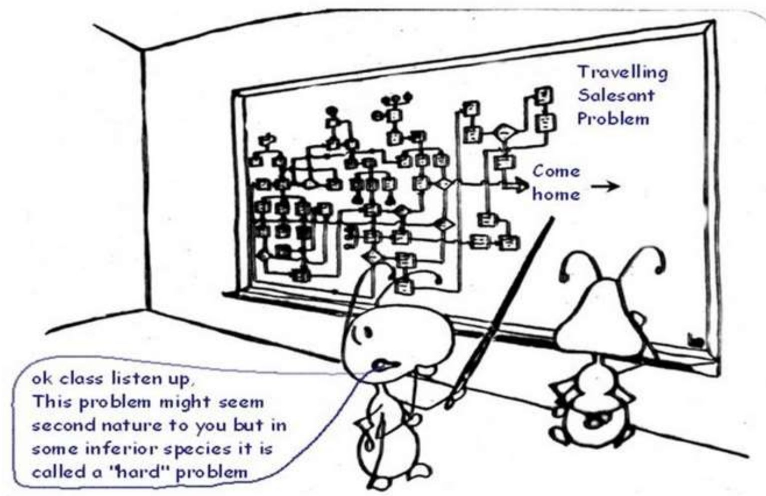
Destination

Eliminated loop

0 - 1 - 3 - 2 - 8 - 5 - 6 - 9

Final loop free path

Ant Colony Optimization



Prepared by:
Ahmad Elshamli, Daniel Asmar, Fadi Elmasri

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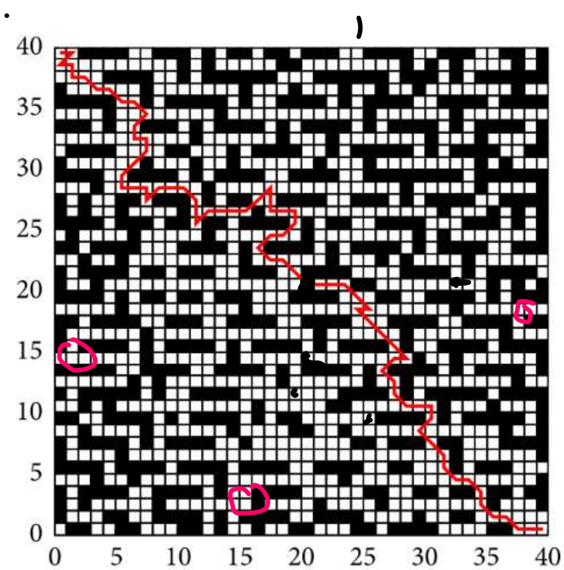
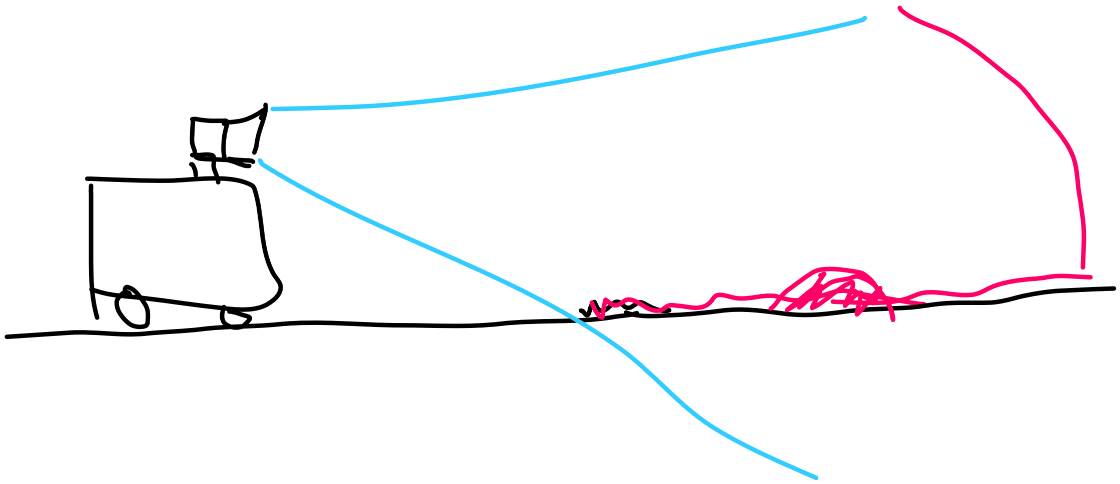
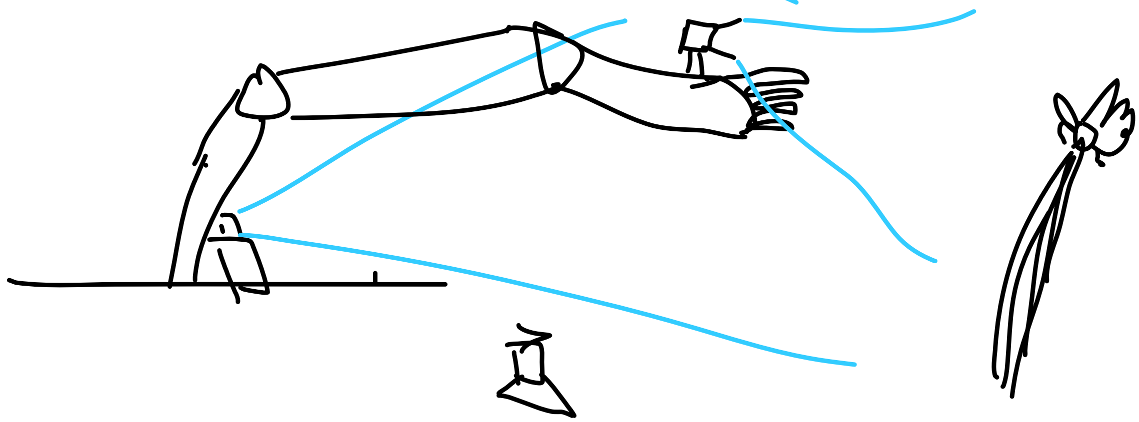
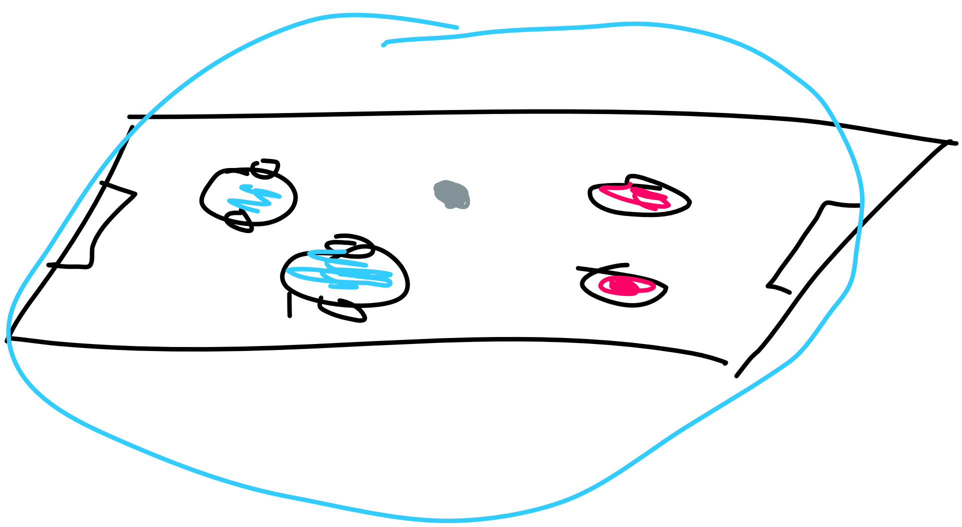
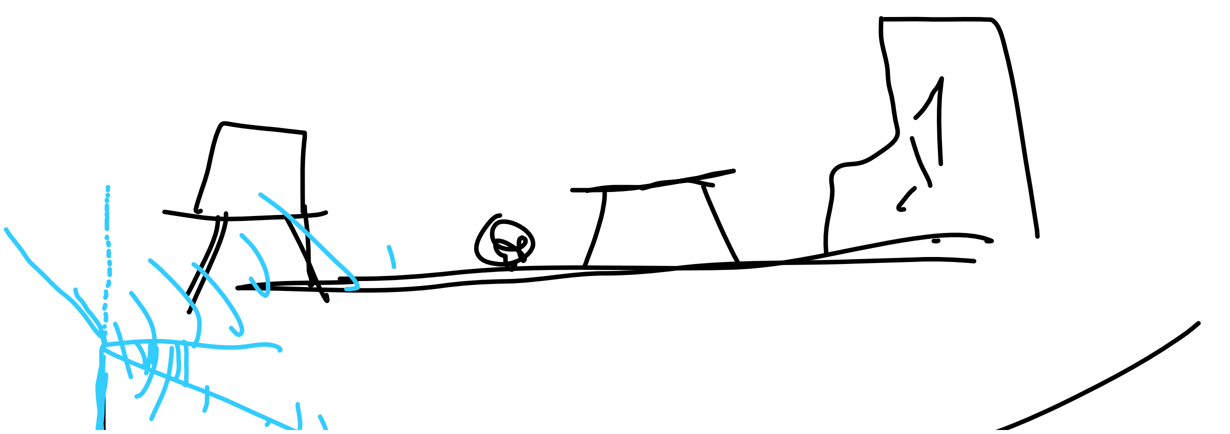


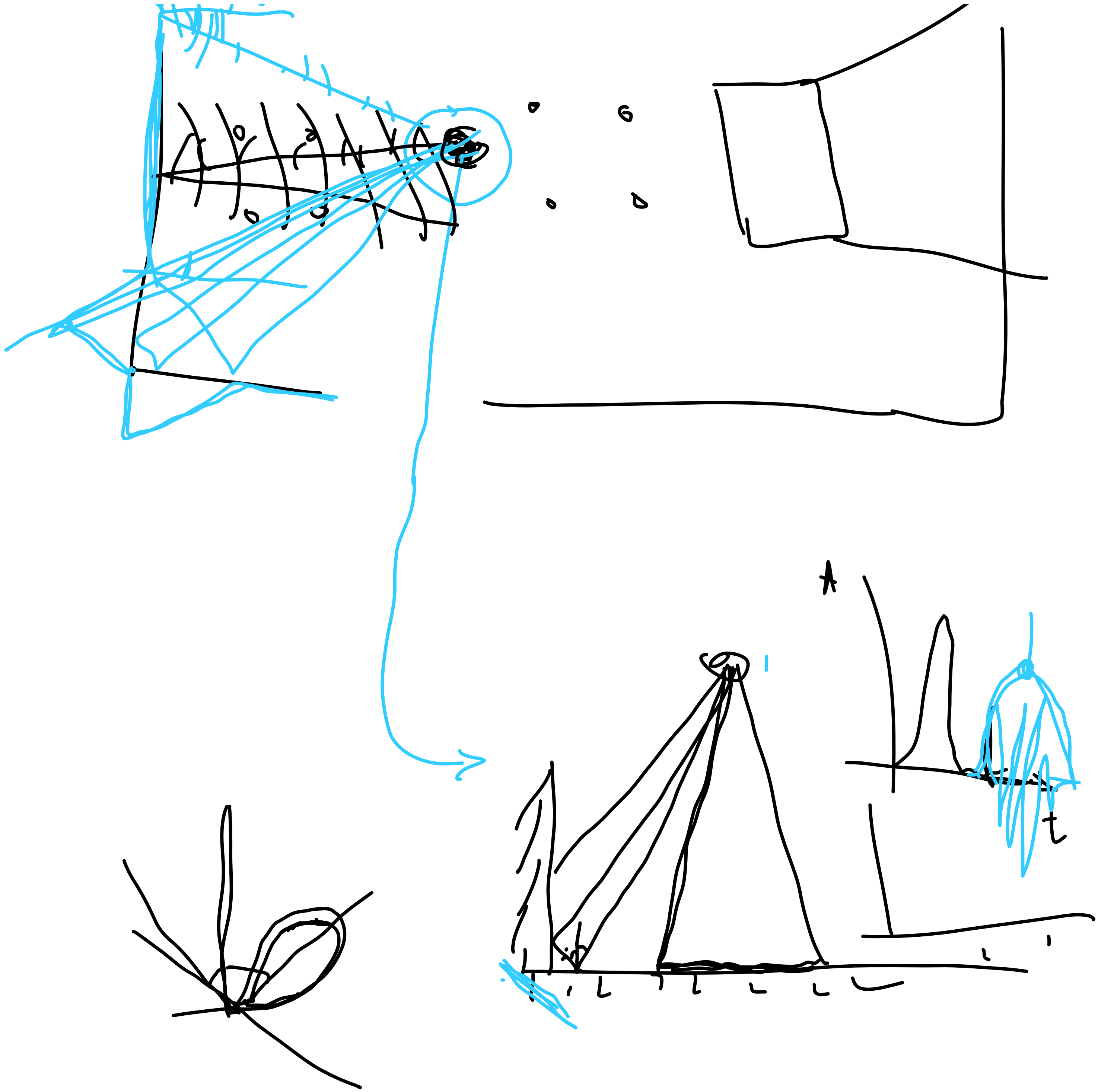
ΑΡΧΙΖΟΥΜΕ 11:15











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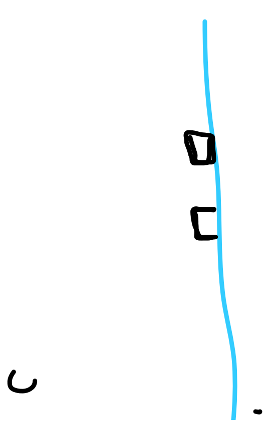
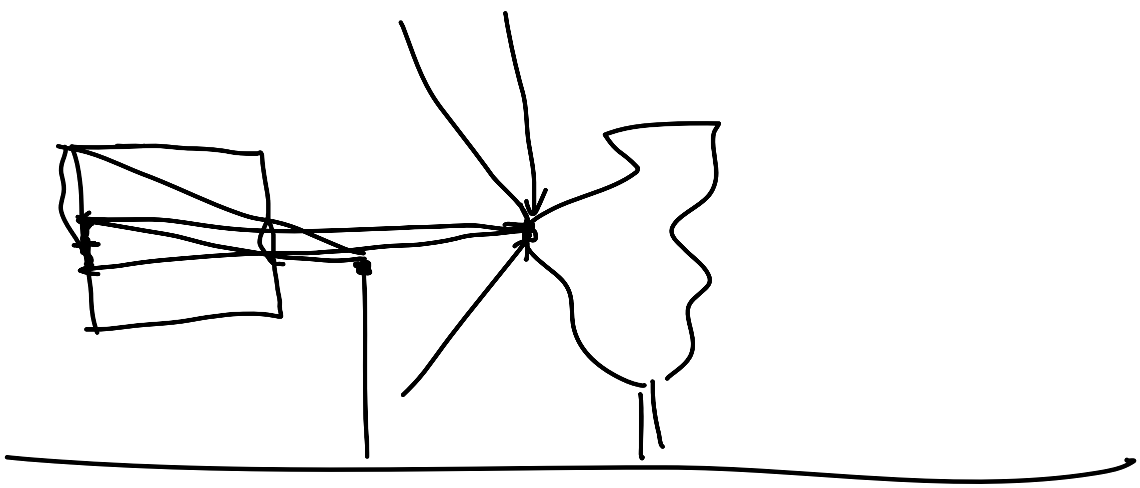
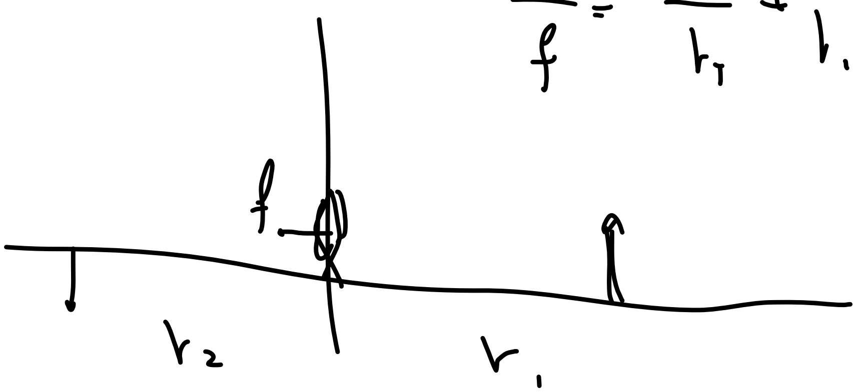
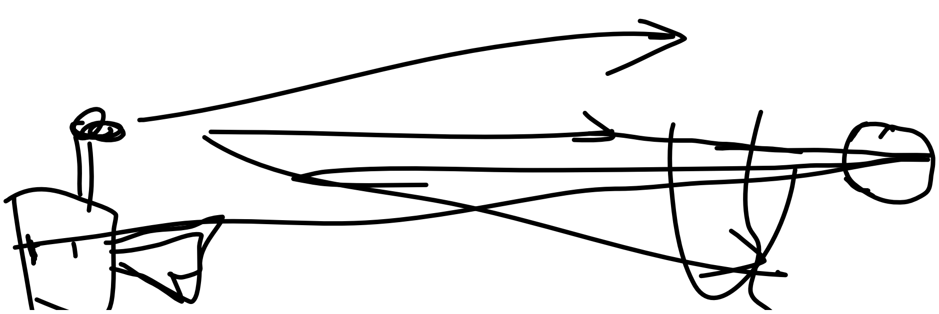


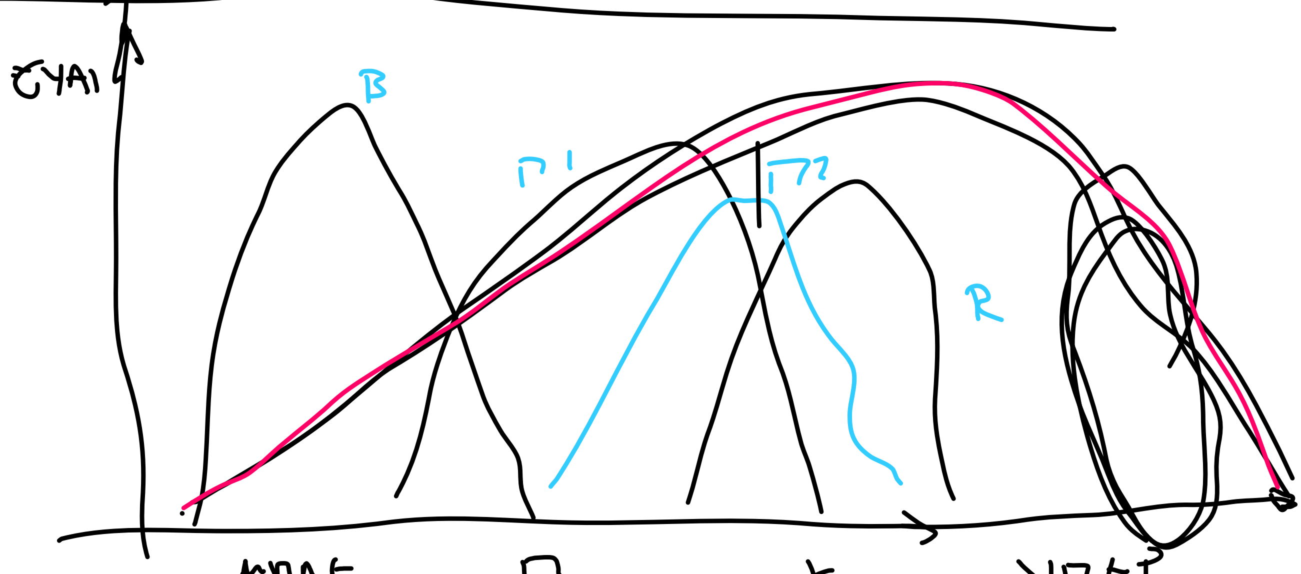


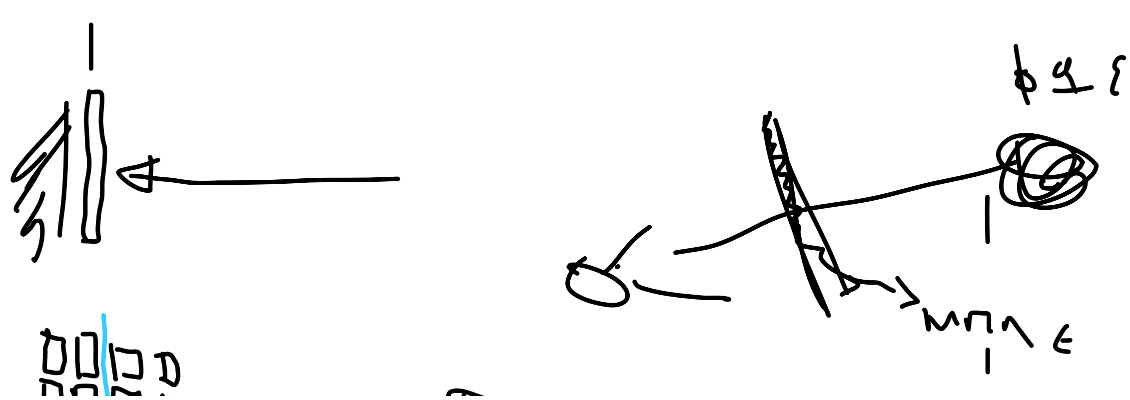
$$\frac{1}{f} = \frac{1}{r_2} + \frac{1}{r_1}$$



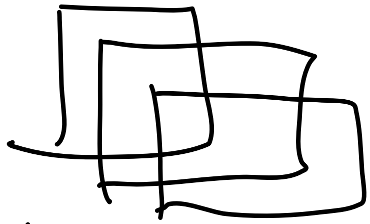


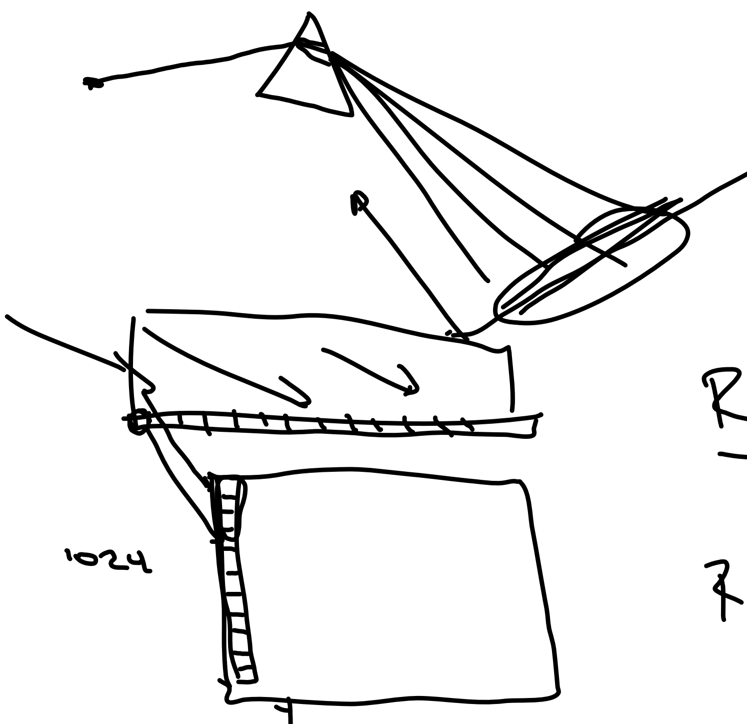

340mm
640mm
ΚΟΚΚΙΝΟ
ΠΡΑΣΙΝΟ
ΜΠΛΕ


B
R
ΜΠΛΕ



RGB





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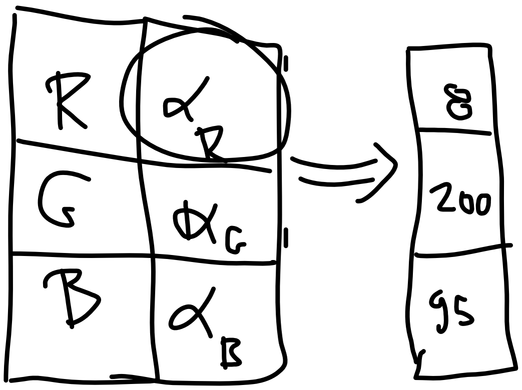
RGB → Lab

RGB → XYZ

⋮

$R + G + B = Q$



$$R' = \frac{R}{Q}$$

$$G' = \frac{G}{Q}$$

$$B' = \frac{B}{Q}$$

$$\Rightarrow R' + G' + B' = 1$$

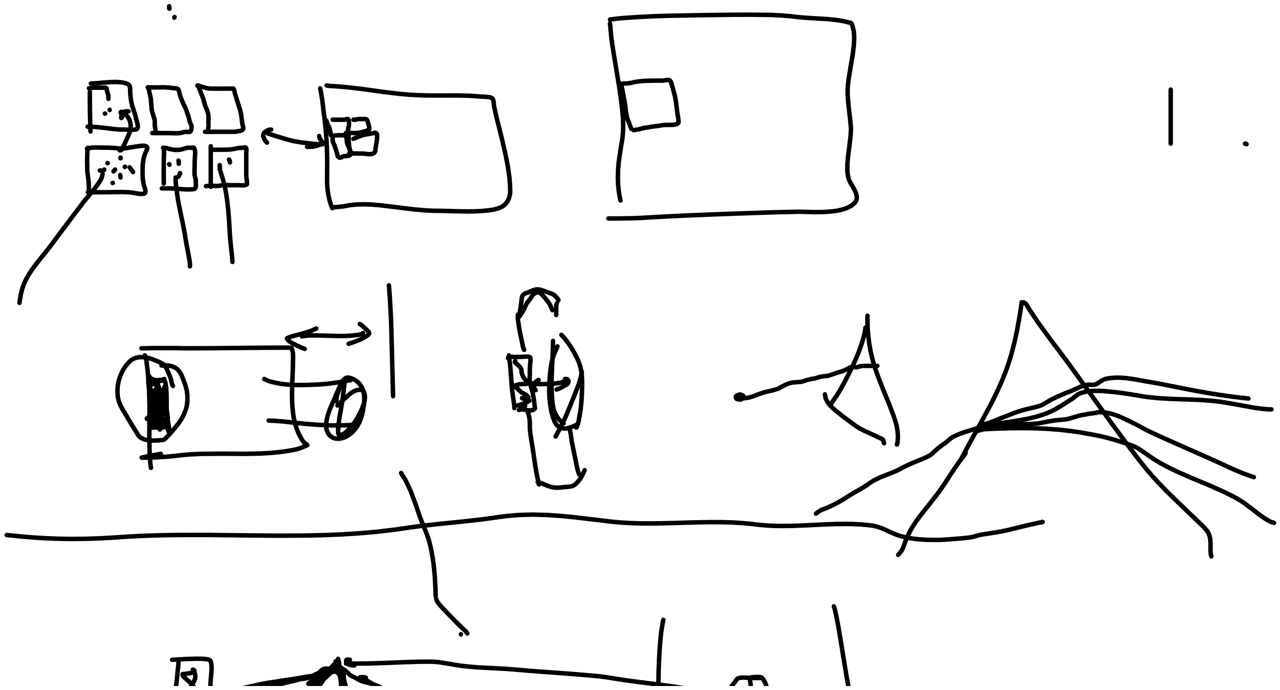
$$N \; [\phi, 2^N - 1]$$

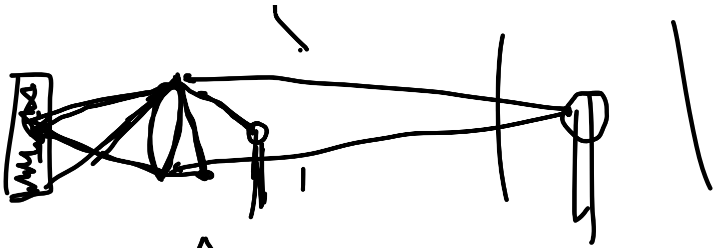
8 bit → ϕ, $2^8 - 1 = 255$

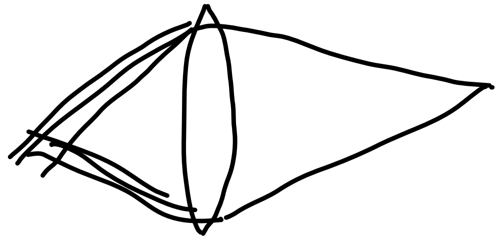
12 bit → ϕ, $4095 = 2^{12} - 1$

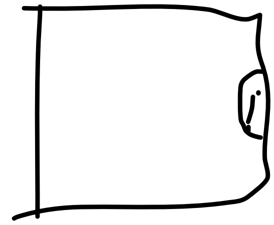
16 bit → ϕ, $65535 = 2^{16} - 1$

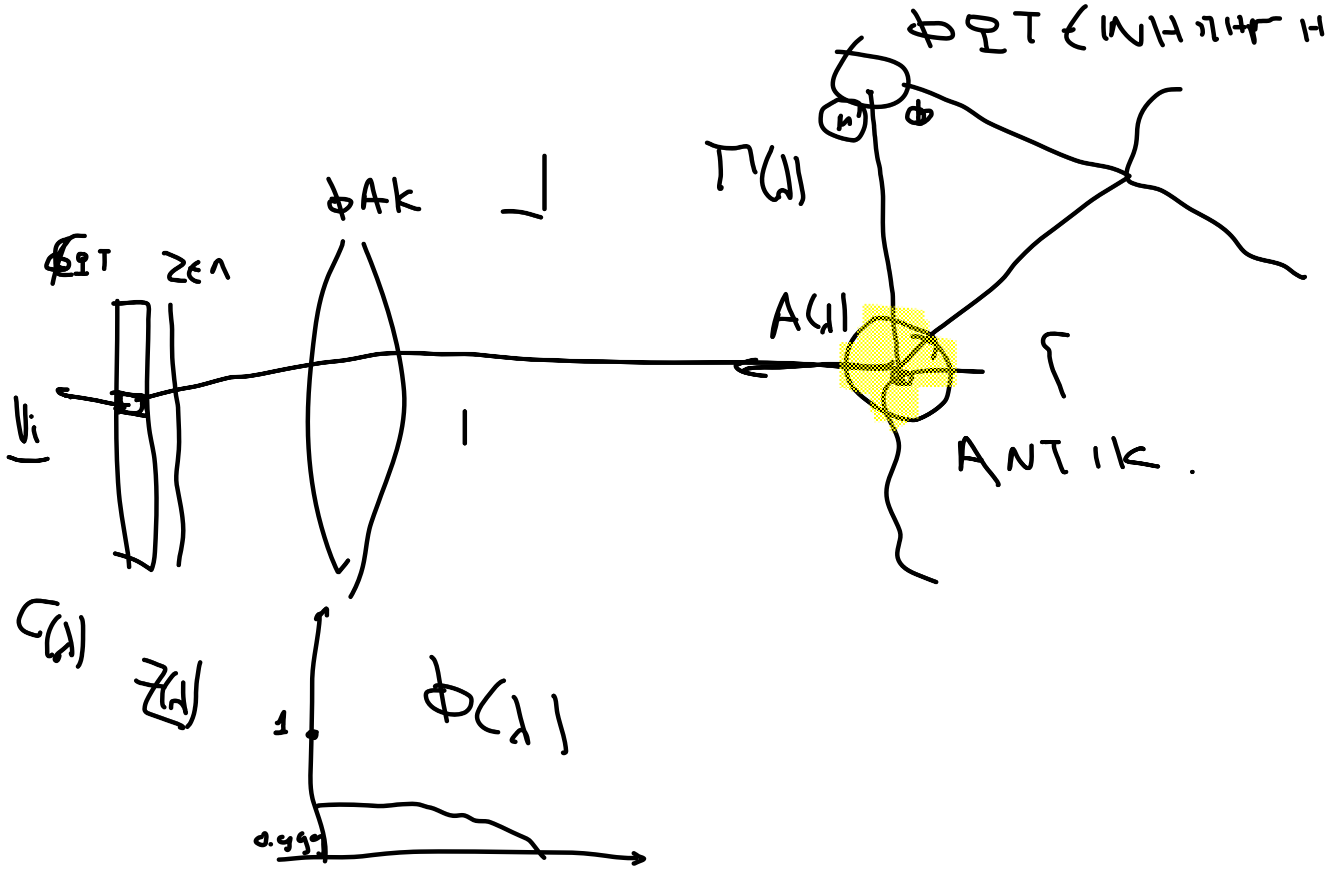
⋮










ΦΑΚ
Π(λ)
A(λ)
ANTIK.
C(λ)
Z(λ)
Φ(λ)
1