



# Snapshot

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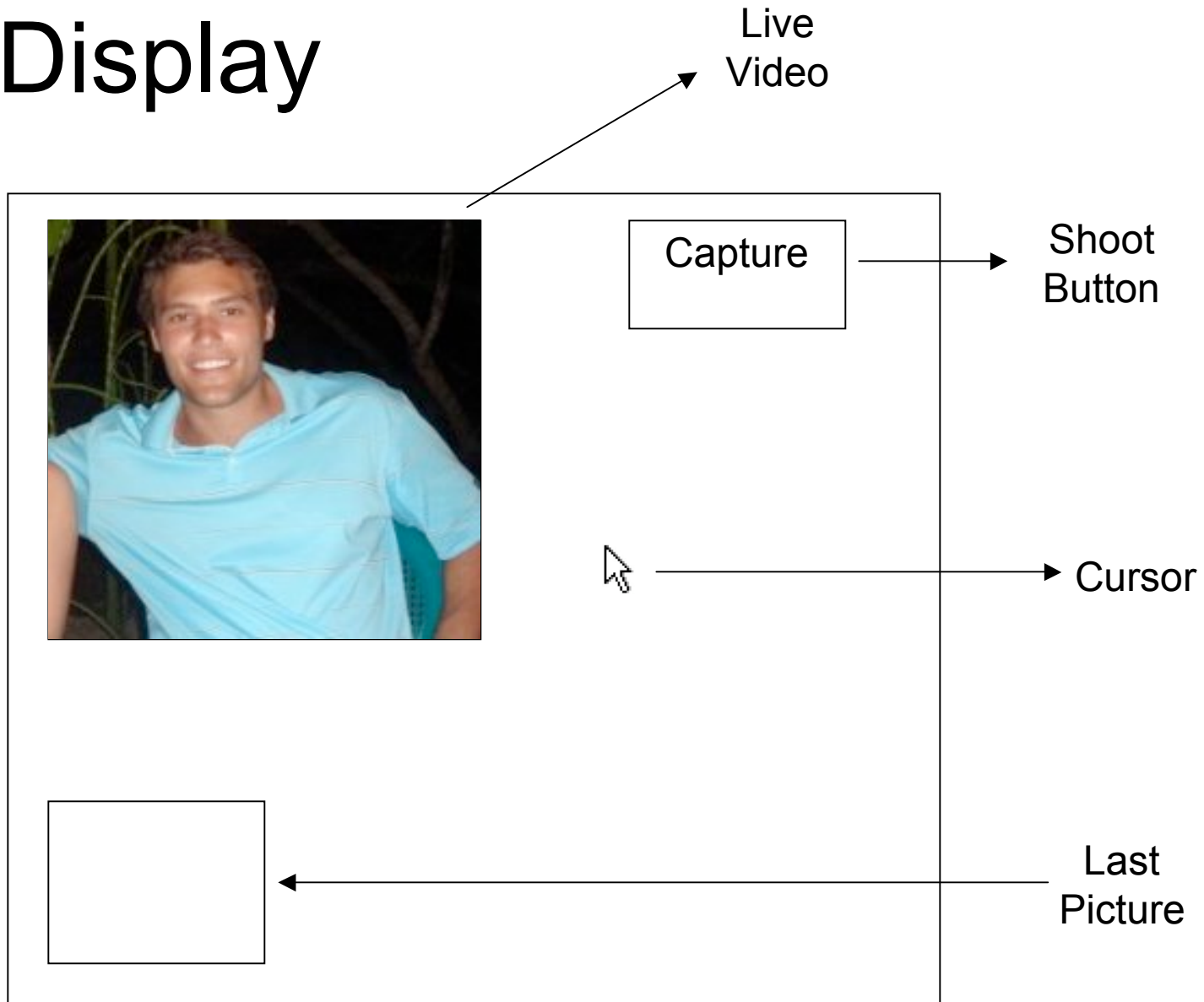
# Project

- Digital Camera
  - User Interface
  - Compression and Storage





# Display

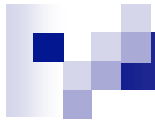




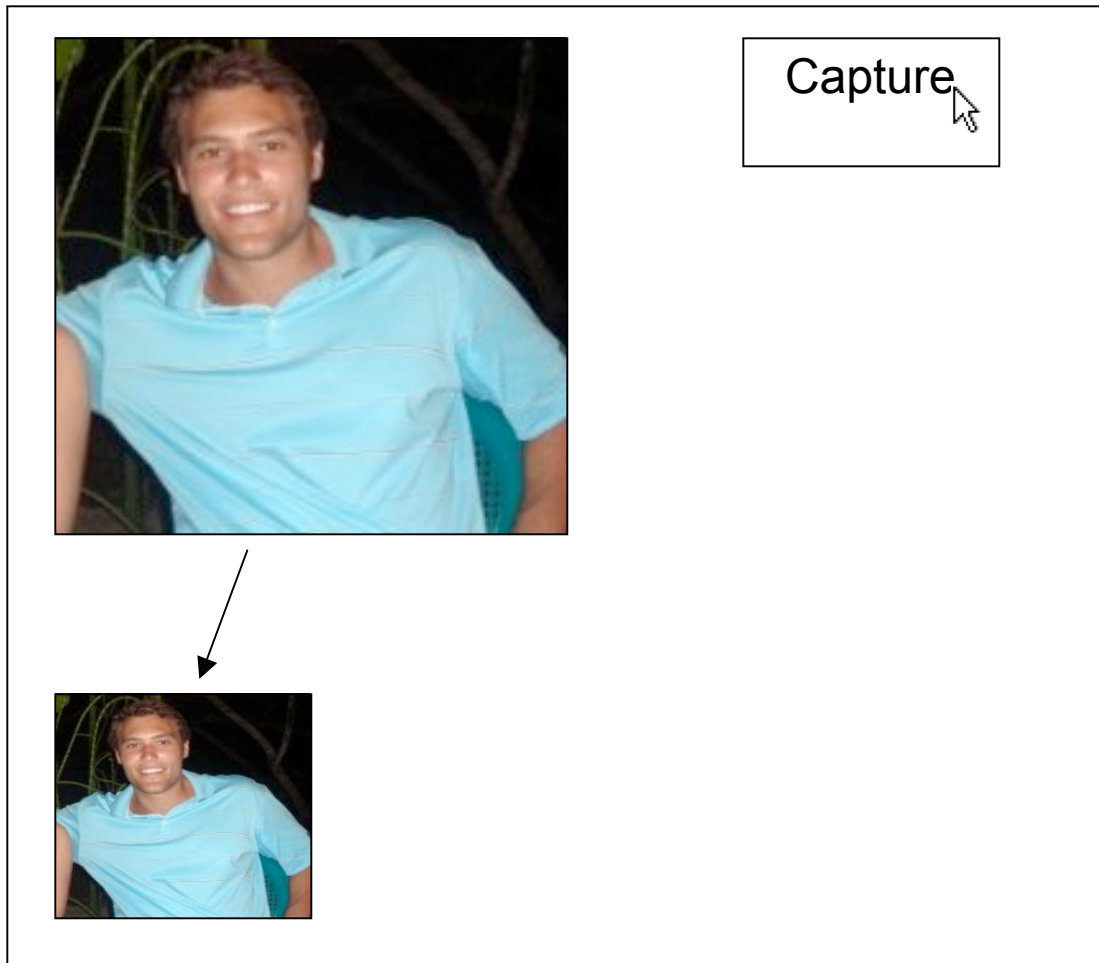
# Display

Capture

Click!

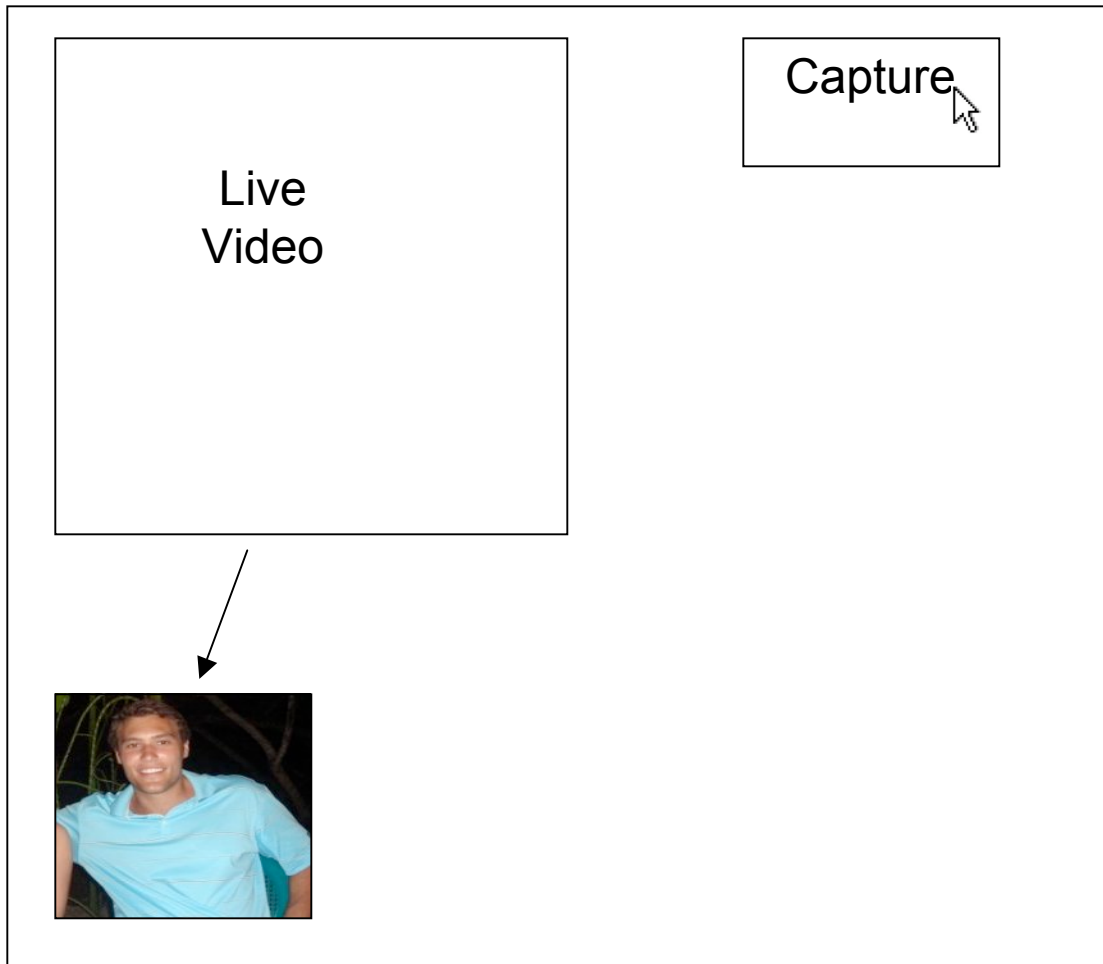


# Display



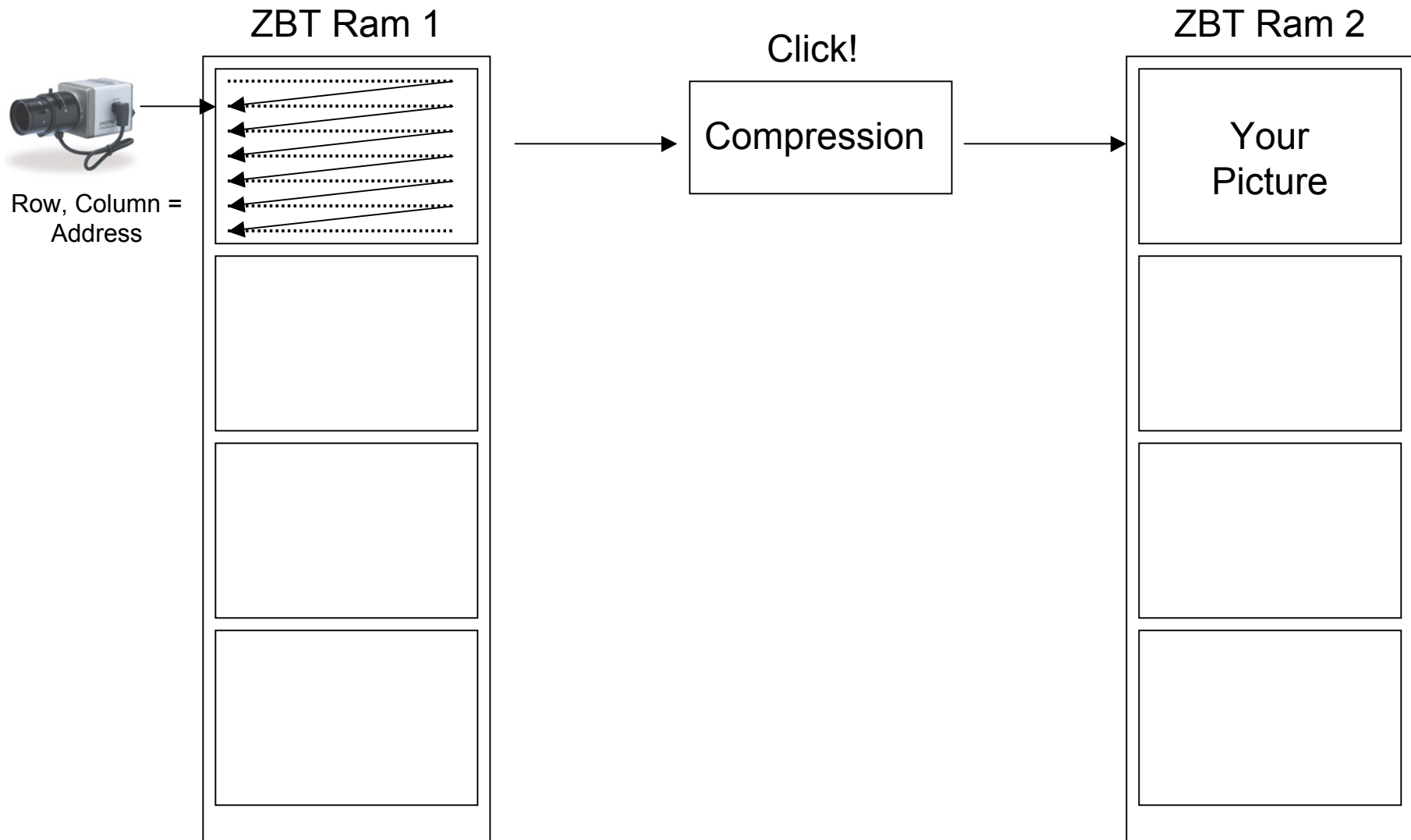


# Display

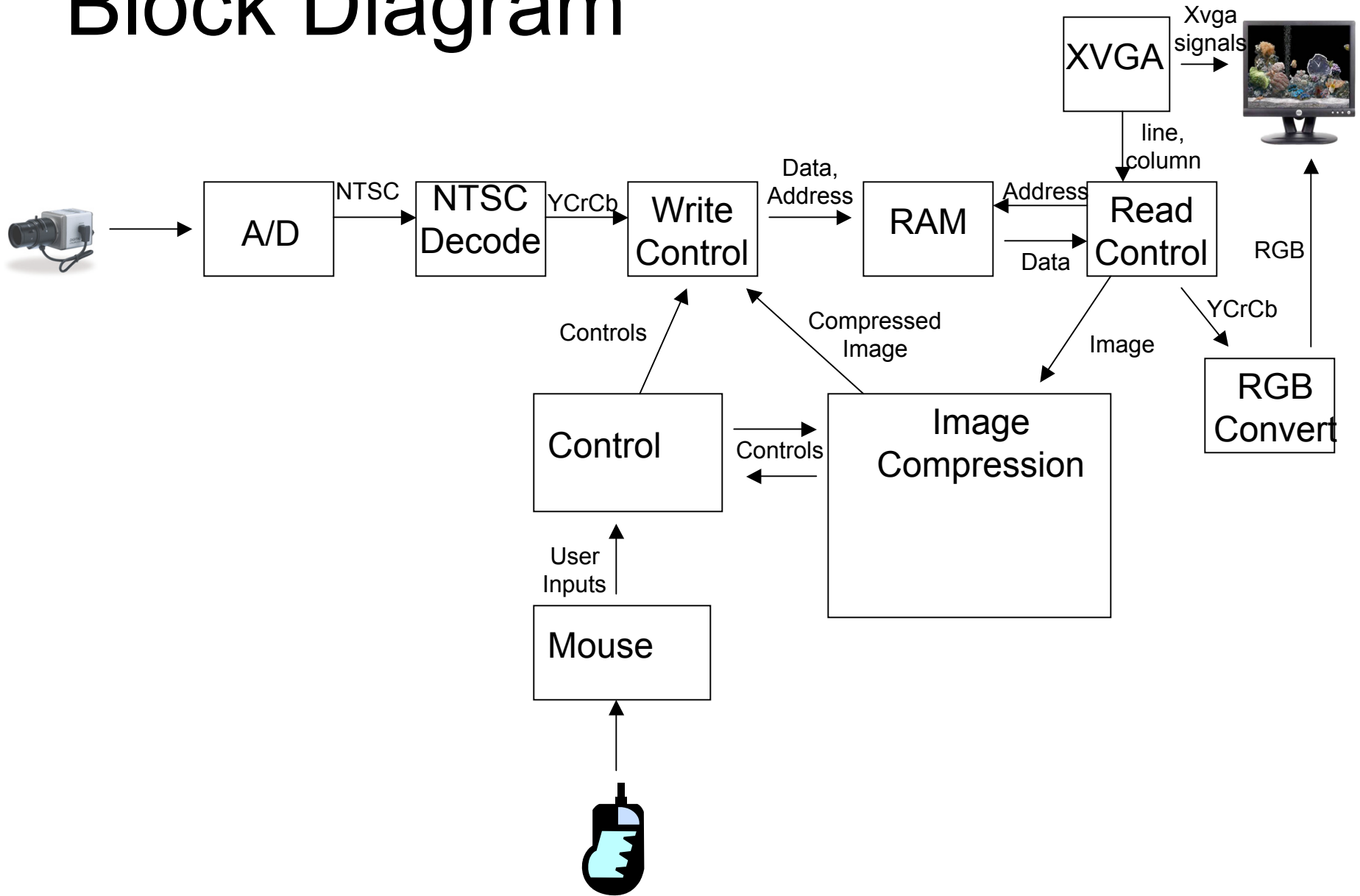




# Storage



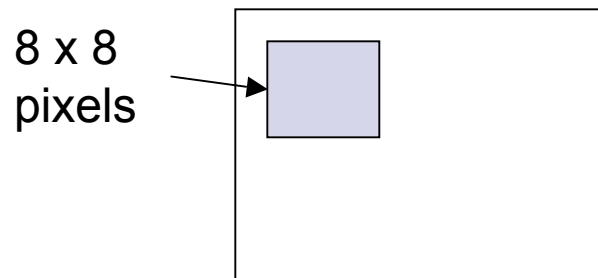
# Block Diagram



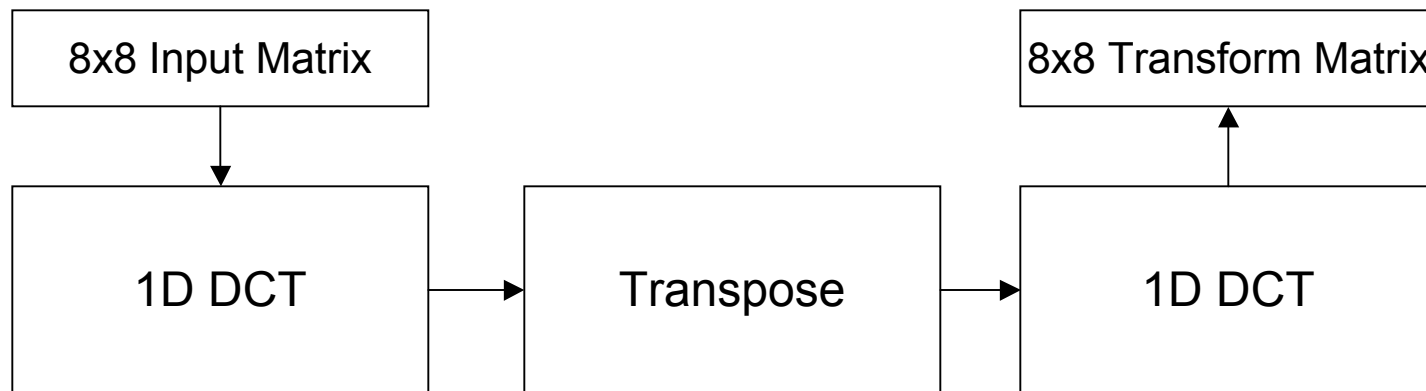


# Image Compression

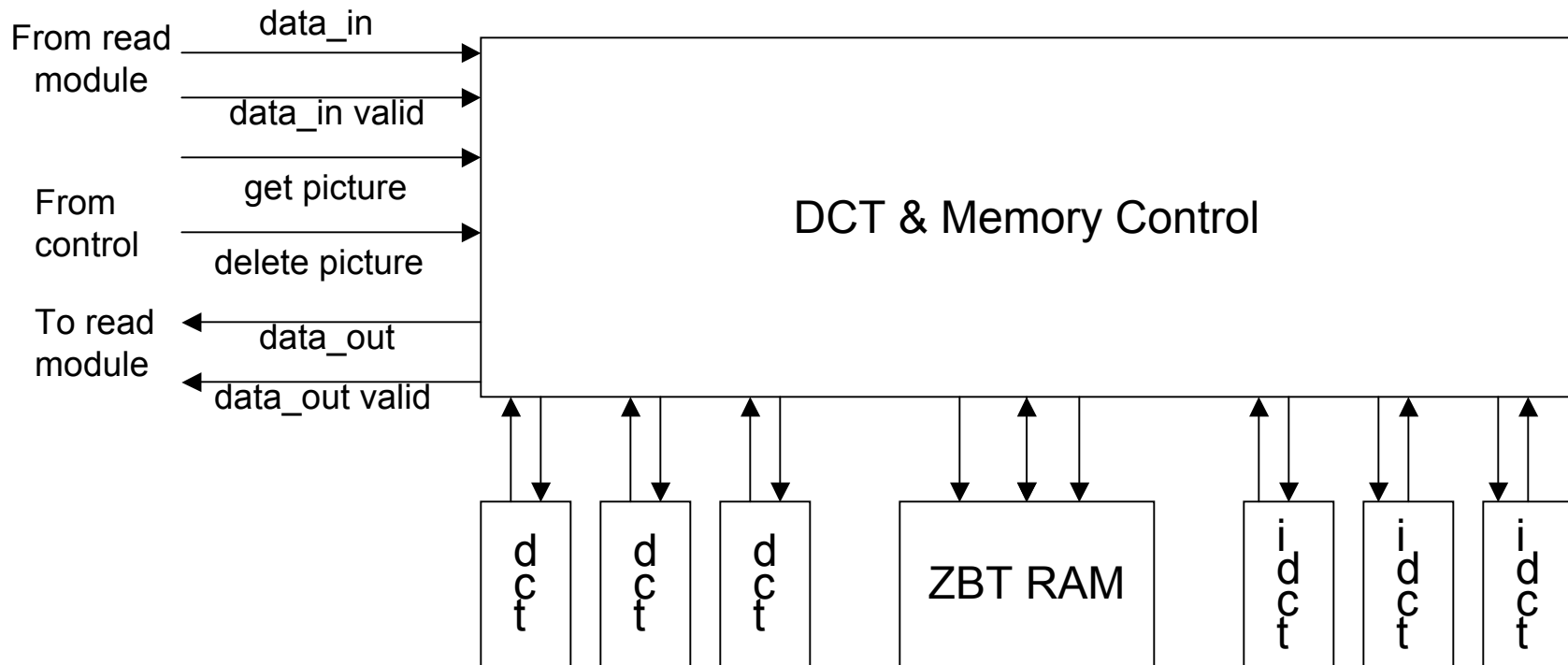
- 2D Discrete Cosine Transform: decomposes image into frequency components
  - Apply 1D transform to rows and then to columns
  - Separately transform 8 x 8 blocks of image
  - Eye acts as natural low pass filter
    - Only store low frequency components of image



180	150	23	12	5	2	1	2
130	125	54	22	8	3	5	4
89	77	45	19	4	2	0	3
45	33	21	15	8	4	3	1
22	9	12	5	1	2	5	0
17	13	7	10	8	6	2	2
8	3	4	6	2	1	3	0
5	2	8	3	1	2	5	0



# Image Compression

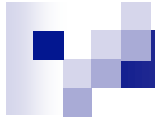


- ZBT Ram can store ~ 5-6 pictures



# Possible Additions

- Visual effects such as zoom, rotate, and blur
- Watermarked symbol that appears after processing the image



Questions?