Laser pointer drawing

Let's speak together 2010

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Equipment

- camera
- projector
- computer
- laser pointer

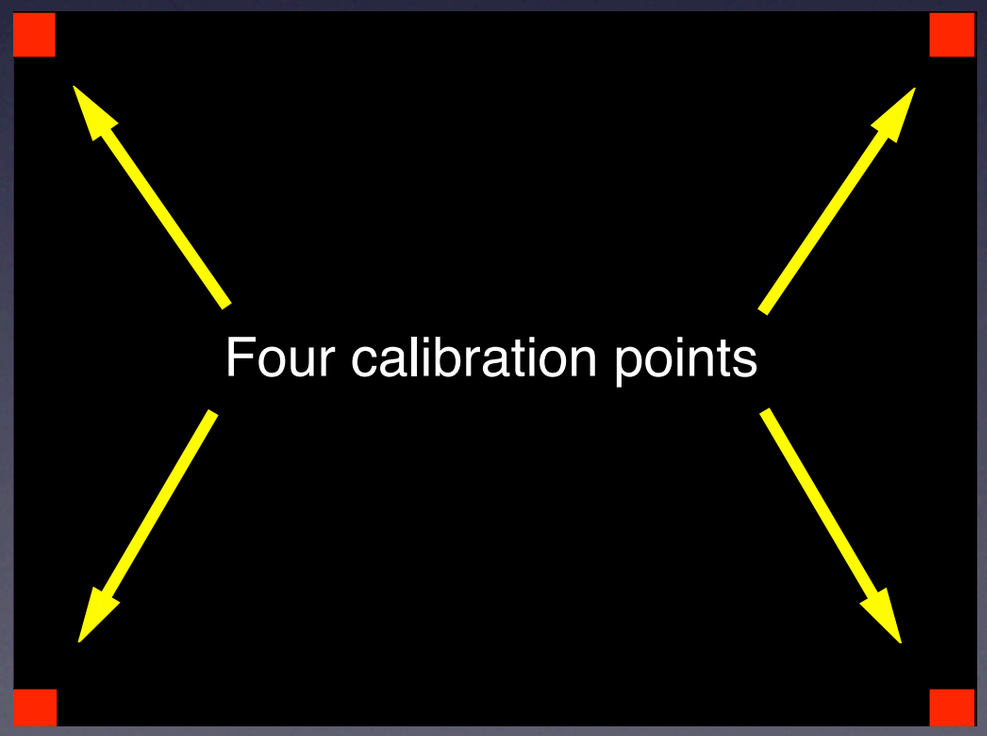
Image processing

- using framework CocoaSequenceGrabber
- finding lightness 5x5 pixels square
  - goes pixel by pixel
  - throws away pixels of bad color

Calibration

- determining where in image are corners of screen
- sequential showing little square in corners
- same finding algorithm

  like in image processing



Transformation

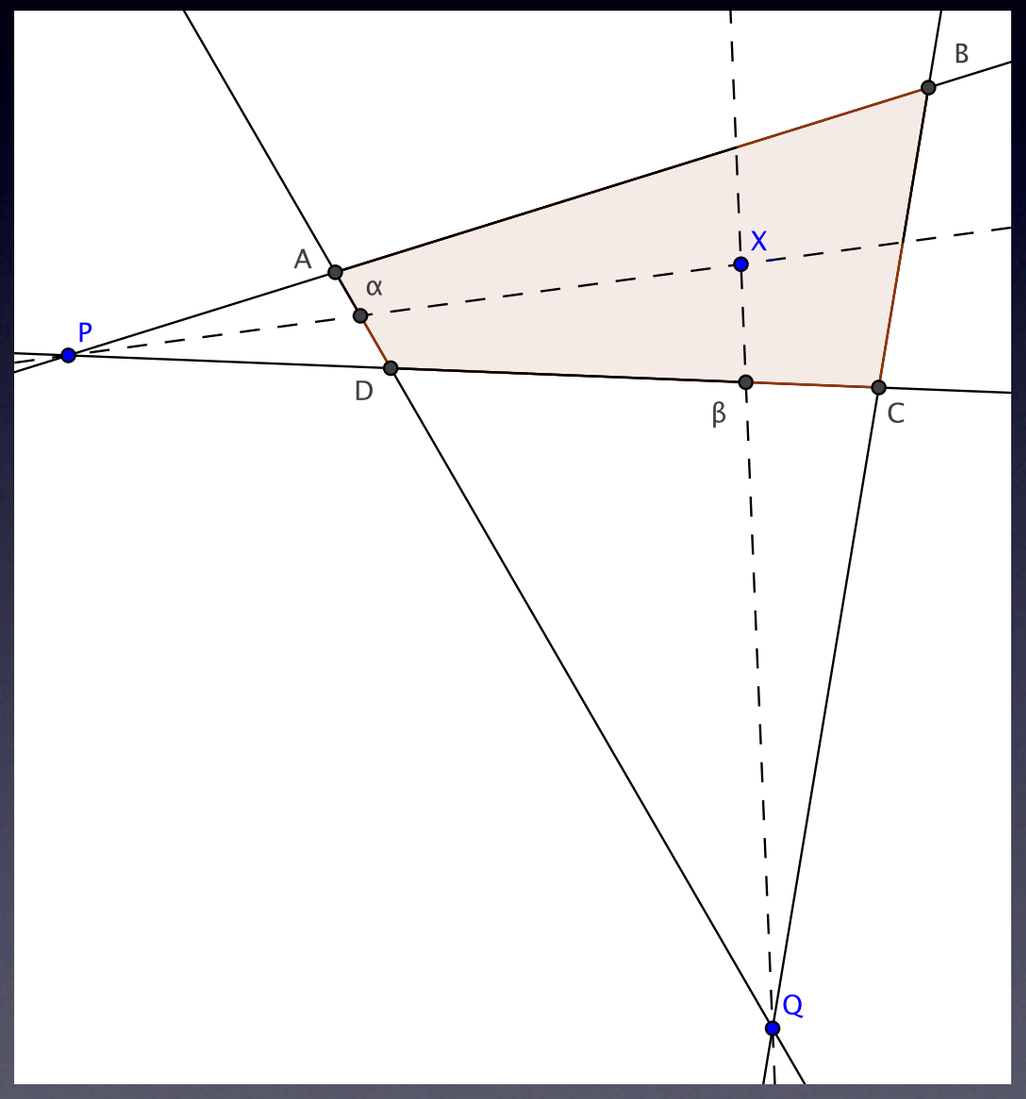
- the original image is distorted
- we need to make rectangle from quadrilateral
- various methods with various results

Ratio transformation

- ratios of lengths stays kept
- generalised in 2 dimensions we get transformation
- not so accurate

Two point transformation

- the best our programmed transformation
- opposite sides of the quadrilateral intersects
- drawing lines through these points and found points
- intersection with sides defines ratios



Graphic transformation

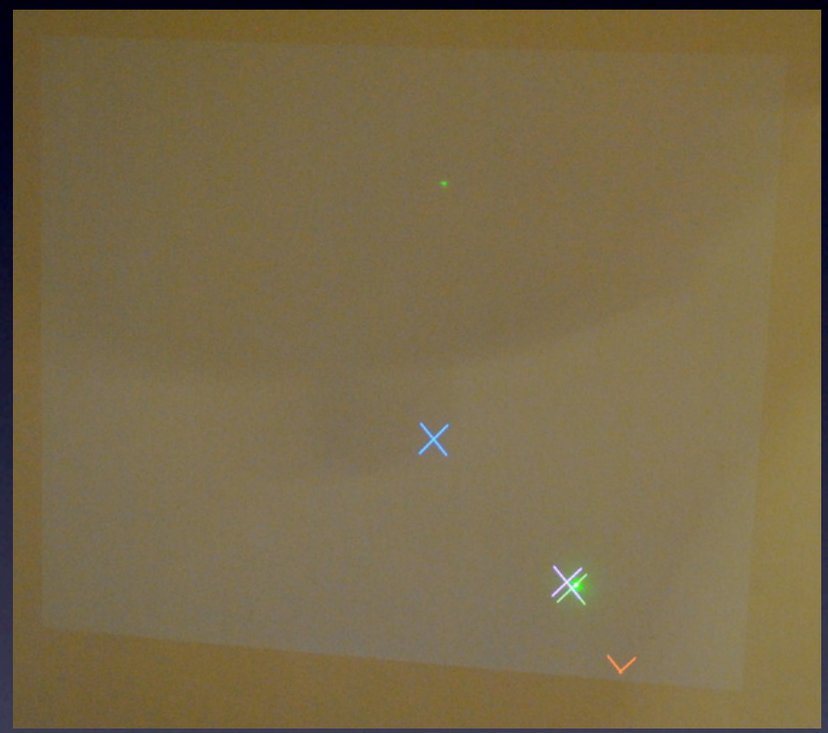
- used in first version of project
- function in Python image library
- very accurate
- can’t port it in Objective C

Other transformations

- trapezoidal transformation
  - easy
  - not very accurate
- angle transformation
  - bad pricipe

Viewing

- using computed ratios
- need to use right color
  - good visibility
  - can’t be determined as laser pointer



Thanks for your attention