Extra Credit Project

Pinhole Camera

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1. Introduction

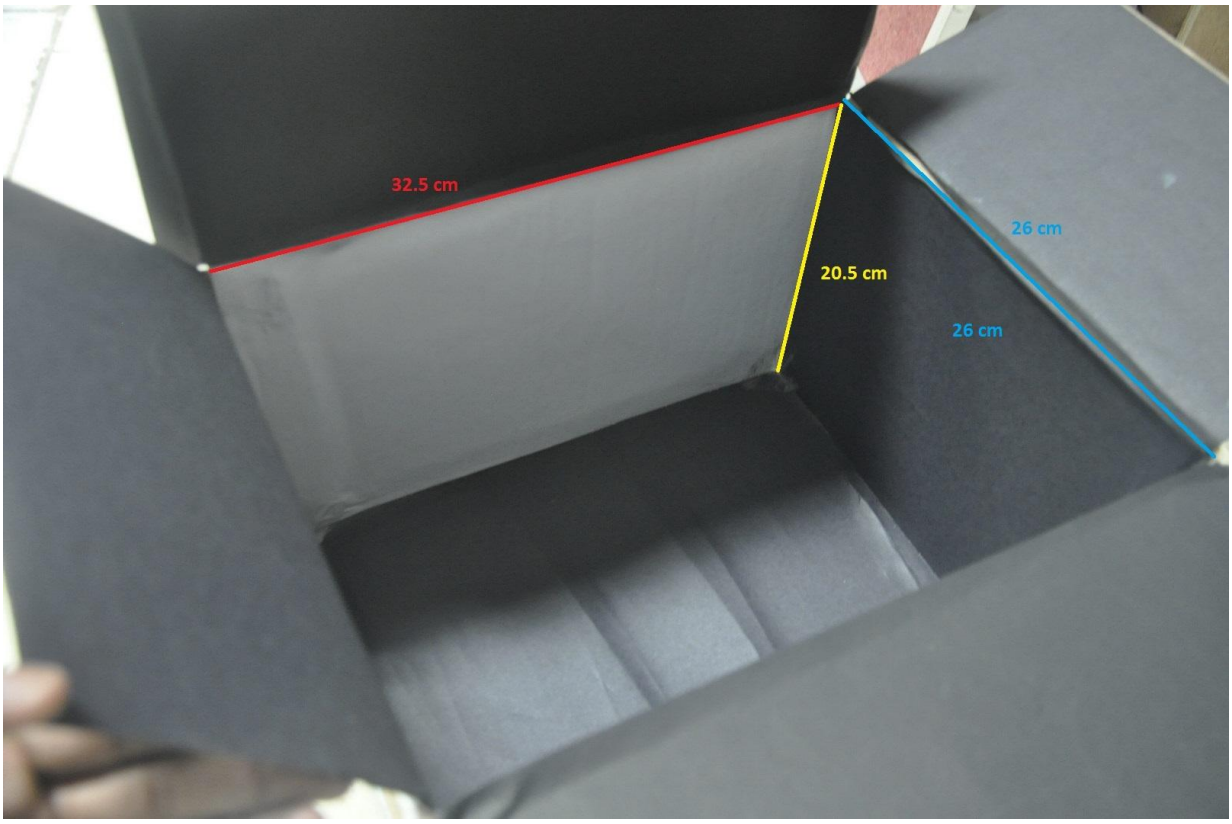
In the attempt to earn this extra credit I constructed 3 major pinhole cameras. The first two were attached with webcams (Logitech Webcam and Sony PS3 Cam) number of cell phones and even tried point and shoot cameras. Even Panasonic Lumix DMC TZ30 didn't have enough expose. Finally I had to use my Nikon D5000 SLT camera This required the third and final piece to be made.

2. Construction

Materials Used

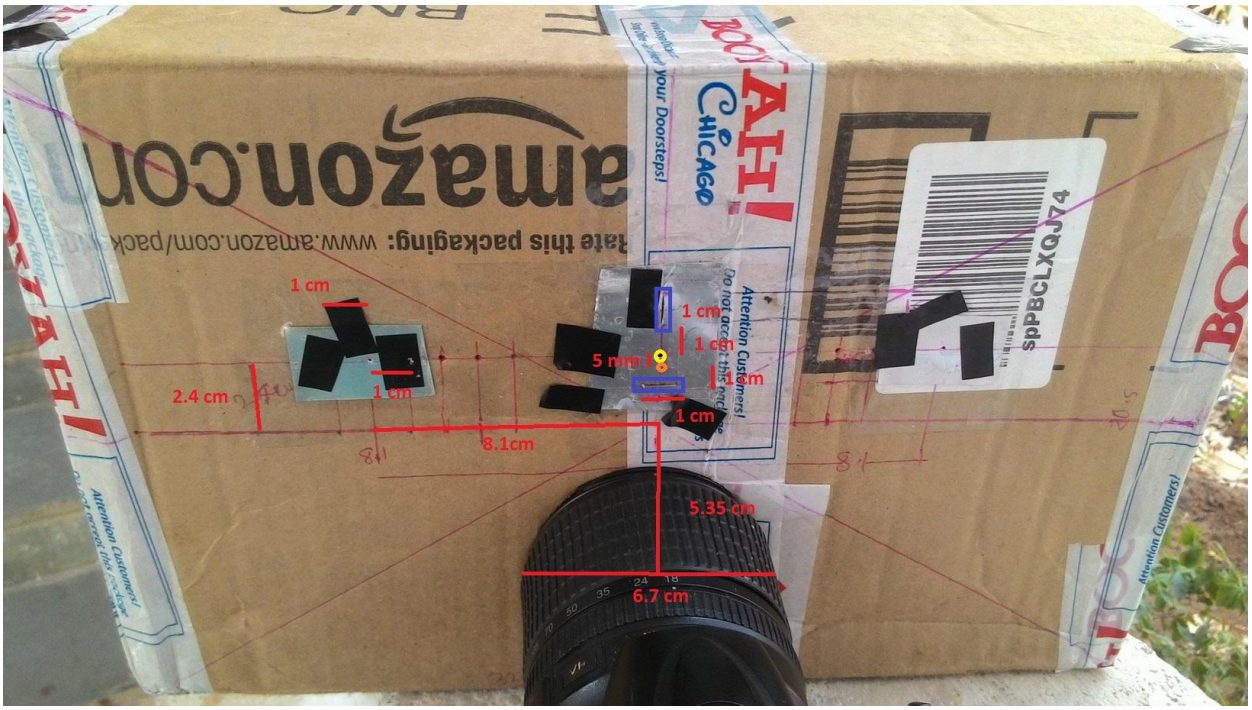
1. Cardboard box size (32.5 cm x 20.5 cm x 26cm)
2. Black chart paper (Thick) – 2
3. Glossy white sheet – 1
4. Thermocol for another scream to change distance
5. Parts of used can for making holes and slits
6. Black electric Tape for covering holes
7. Thick sellotape for closing box and sticking ends
8. Fevicol for glue
9. Nikon D5000 SLT camera with Nikon Dx 18-105 mm auto focus lens

The dimension of the box is 32.5 cm x 20.5 cm x 26cm



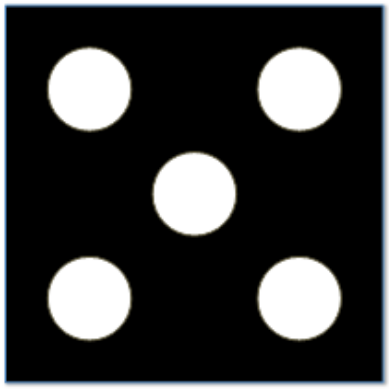
First the camera had a wide 6.7 cm camera lens peaking in the pinhole camera and second the previous Pinhole camera was capturing camera to with Nikon logo so I had to move holes 2.4 cm up from central line.

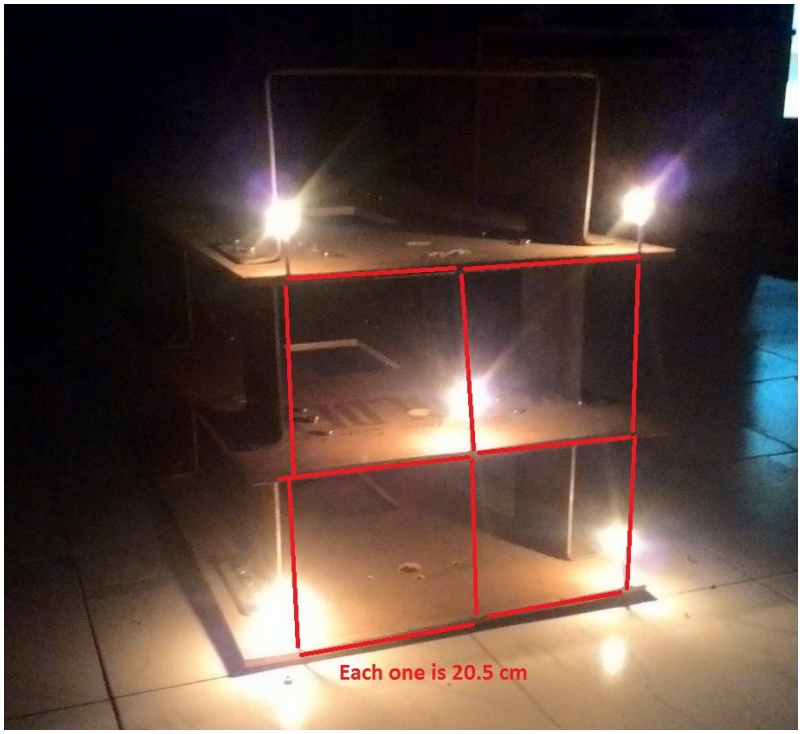
I had made multiple slits and holes



3. Imaging

The suggested pattern was replaced by candles as it needed to be experimented in very bright sun only.





For all Images were taken by Nikon D5000 at ISO Hi1 with Exposure bias +1.7 to +0.7 step depending on light condition. The exposure tim varied from 15 sec to 30 sec. Focal length was at 18 mm usually few experiment used 24 mm too to fix the scream well. Aperture was at 3.6.

In SLR mirror some reflections are observed in center which distort the results.

Set 1 a static scenes

Set 1 b Pinfie

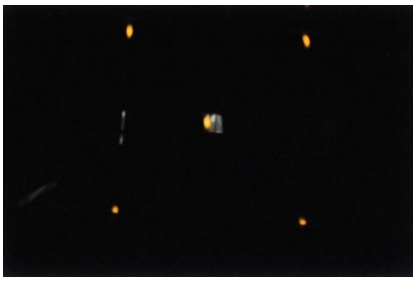
Set 1 C Moving objects- first picture is on a mobile camera flash moving while others show moving hands not visible

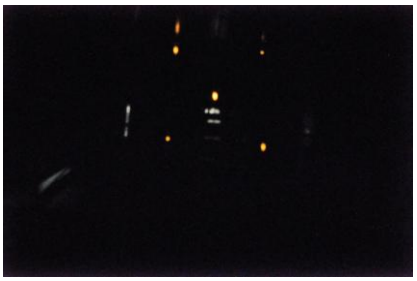
Set 2 a -First is with regular or big hole while second is with is regular hole. The second image is sharper but darker too.

4. Experiments

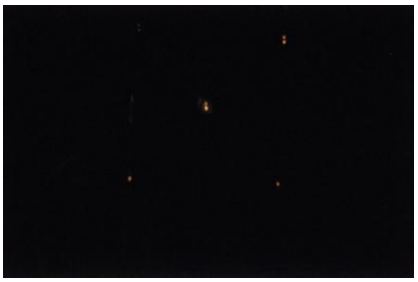
The experiment was conducted from 80 cm then 120 cm and finally at 160 cm

For central hole Normal (called big in experiment)



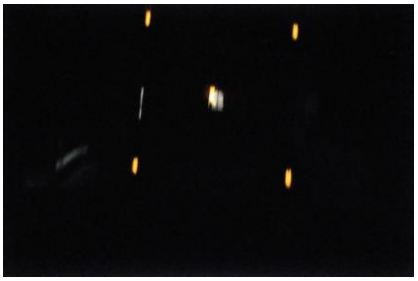


For central hole small



- Observation the image is sharper but darker in small set 2 a

For vertical slit



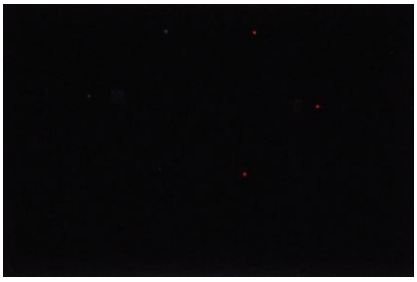
- Observation the image is elongated vertically set 2 b

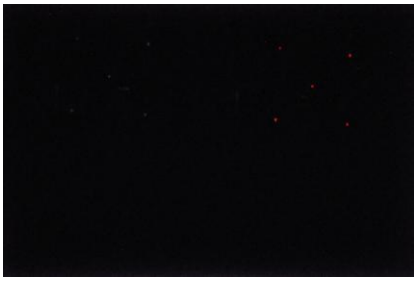
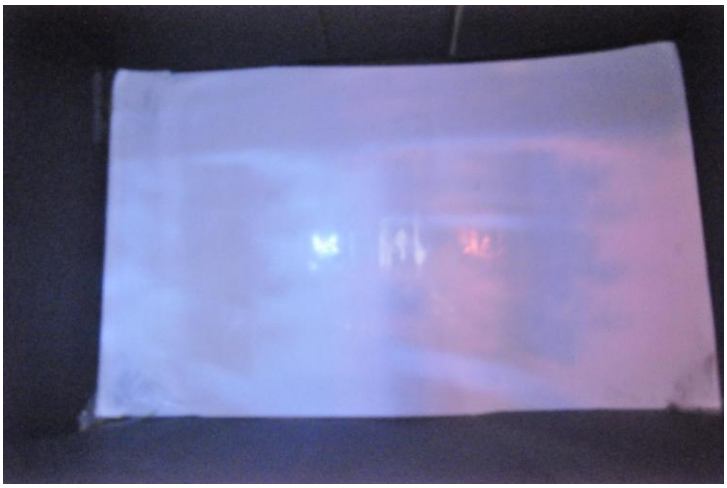
For horizontal slit

- Observation the image is elongated horizontal Set 2 b

Set 3

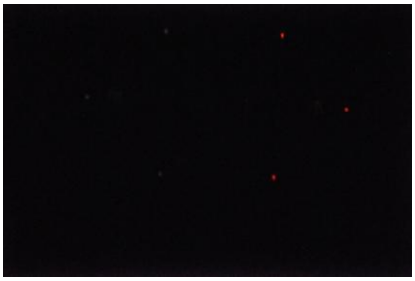
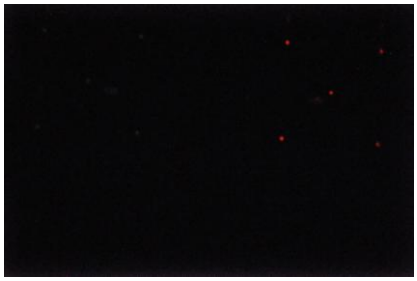
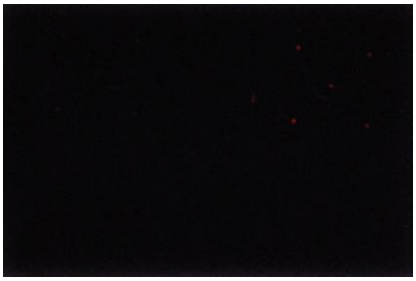
For mid 3D points (at ¼ length)



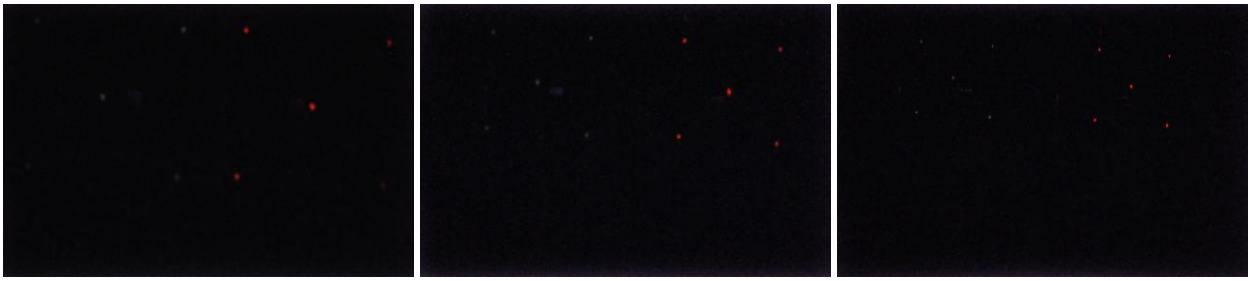



- Observation blue colour slit on yellow candle was very week and faint spots are visible

For more apart 3D points

For more close 3D points



- Observation 3D construction for far points better in apart and near points better in close -Set 4 b

5. Conclusion

Using SLR is must

Good light condition limits pace of work.

Candle experiment was useful now I think I should have taken White LEDs instead.

Corner sealing is must and thin sheets are porous.

Good experience. Should be broken two steps – time was more than enough – I'm just used to deadlines.