

# Panoramic Imaging with SVAVISCA Camera - Simulations

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Hadas Roth

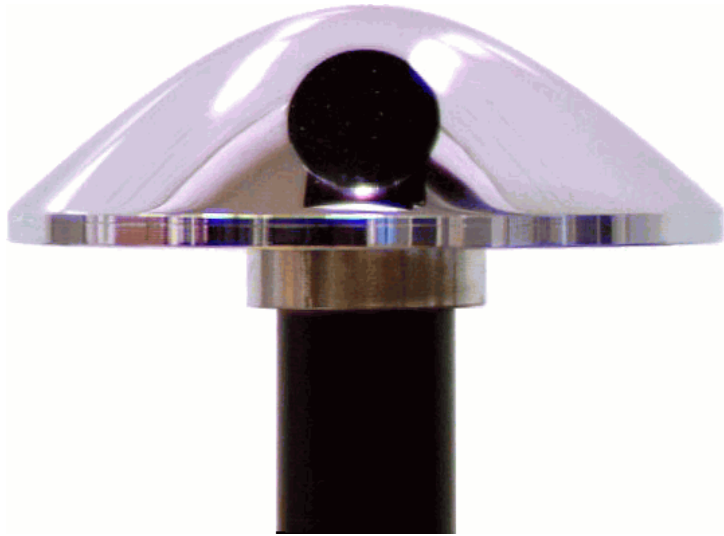
Center for Machine Perception  
Czech Technical University  
Czech republic  
pajdla@cmp.felk.cvut.cz  
<http://cmp.felk.cvut.cz>

and

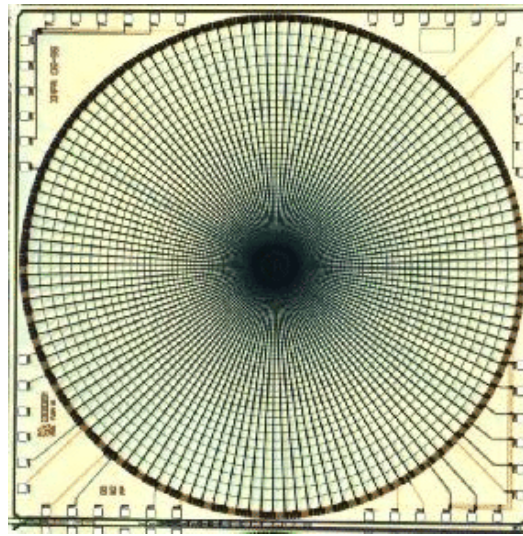
Faculty of Electrical Engineering  
Technion  
Israel  
sharasr@techst02.technion.ac.il  
<http://www.technion.ac.il>



## Simulations of Panoramic Imaging with SVAVISCA Camera



Hyperbolic mirror



SVAVISCA sensor

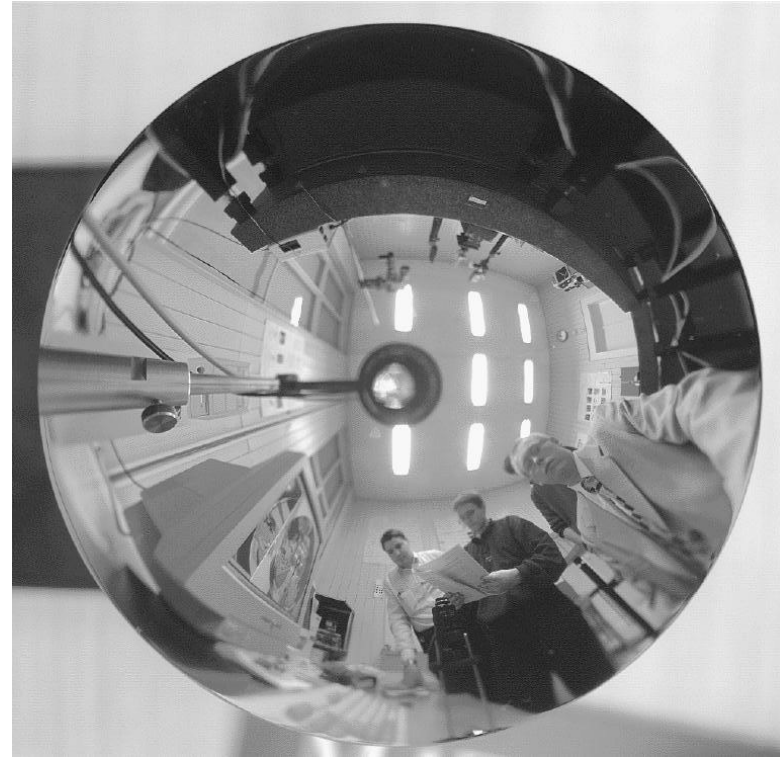


Omni-camera

## Acquisition of real scenes



A hyperbolic mirror  
+  
a conventional CCD camera

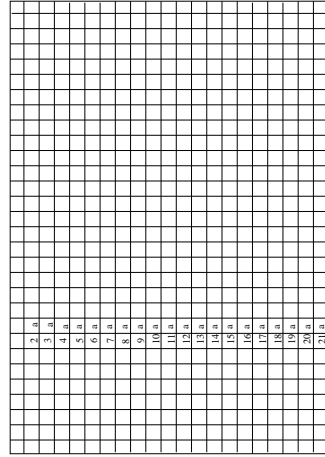


a panoramic image

# Acquisition of artificial scenes



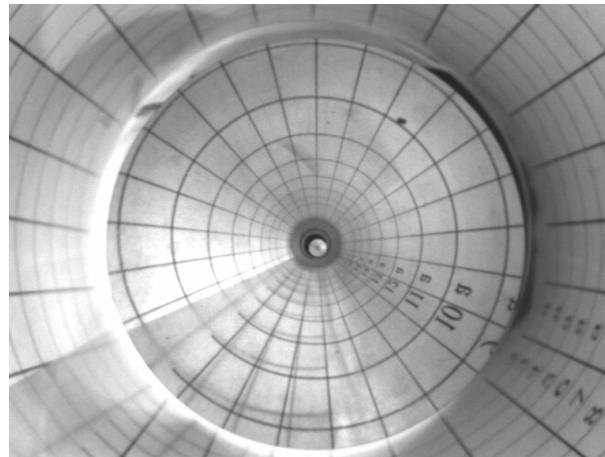
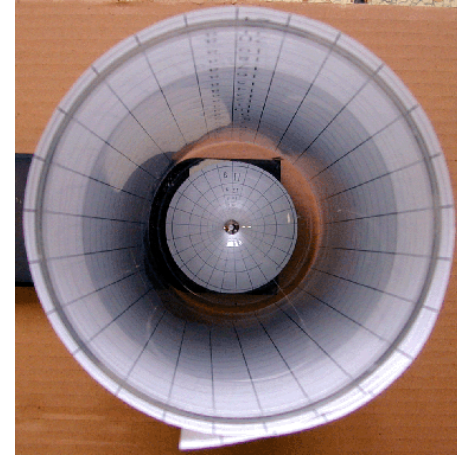
+



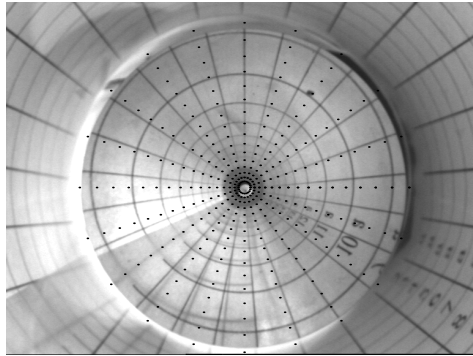
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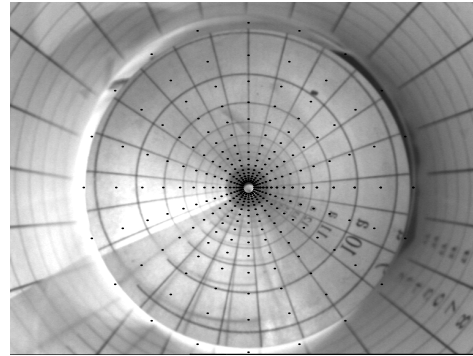
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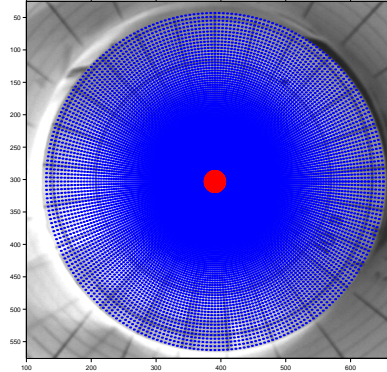
# Sampling of panoramic images



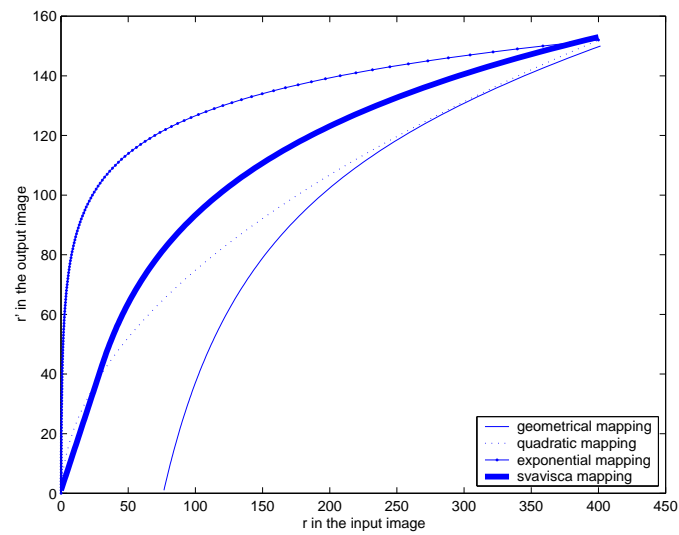
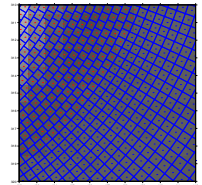
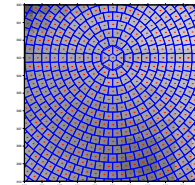
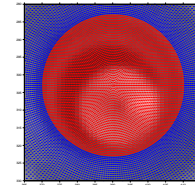
square root



logarithmic



SVAVISCA

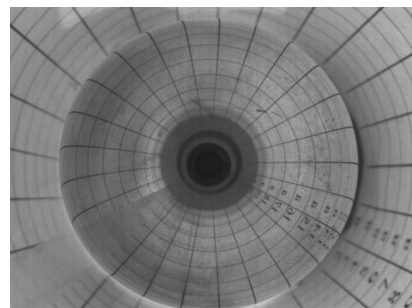
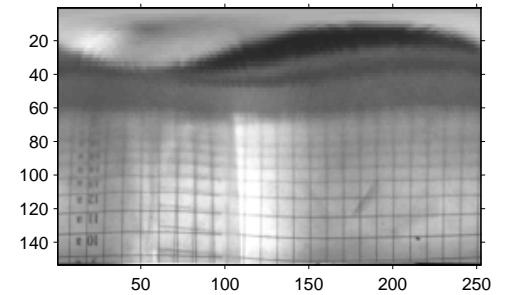
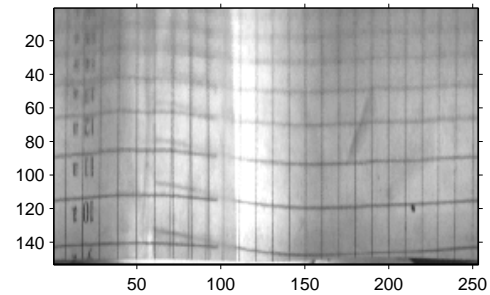
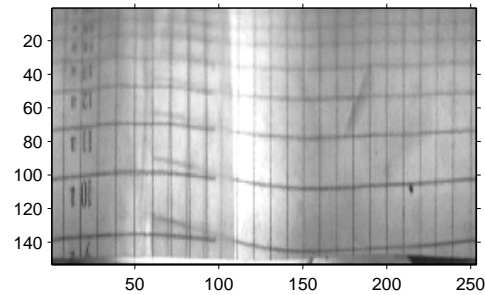
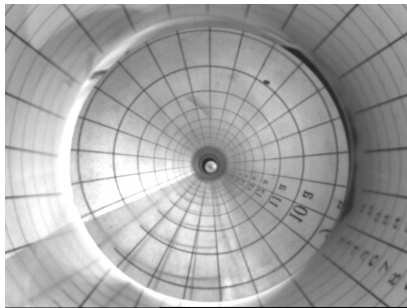


radius transformation

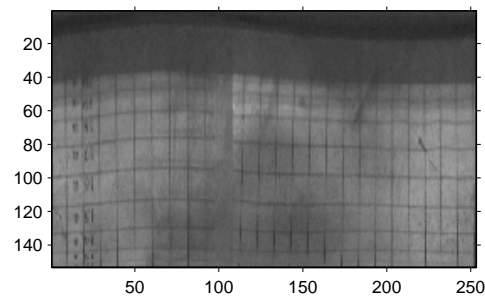


## Resampled images of artificial scene

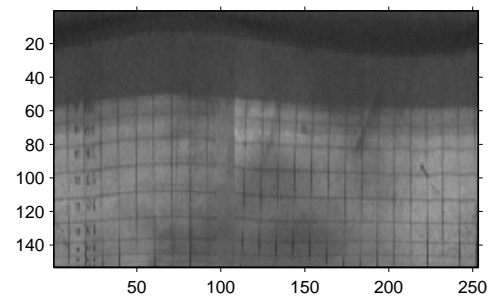
hyperb. mirror



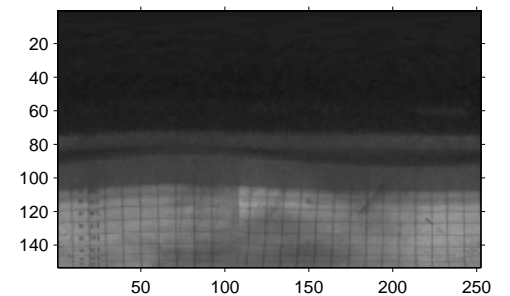
square root



logarithm



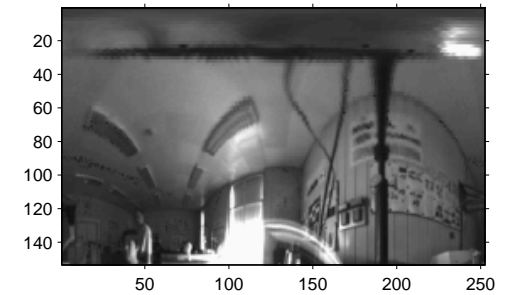
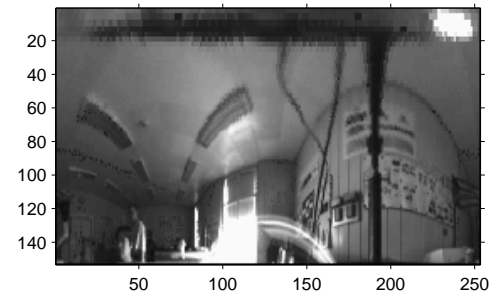
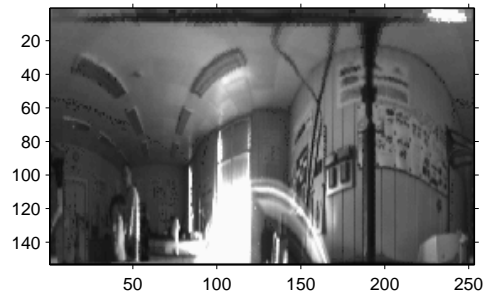
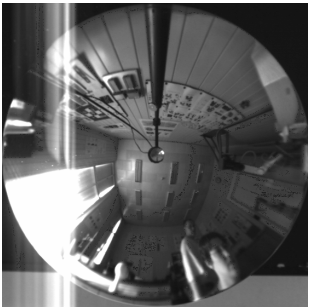
SVAVISCA



spheric. mirror

## Resampled images of real scene

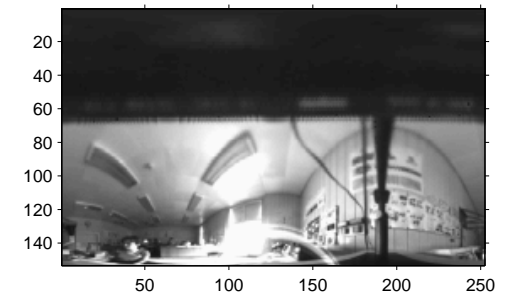
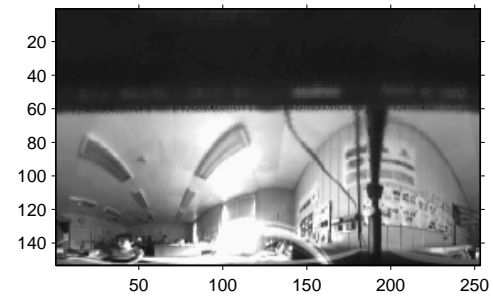
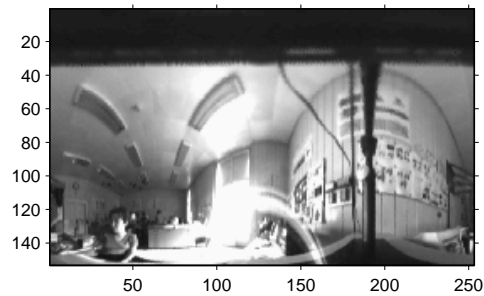
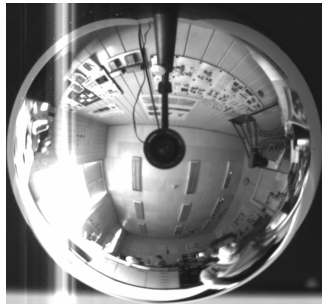
hyperb. mirror



square root

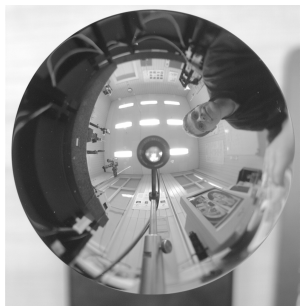
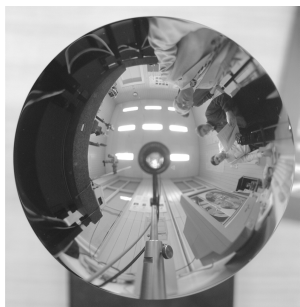
logarithm

SVAVISCA

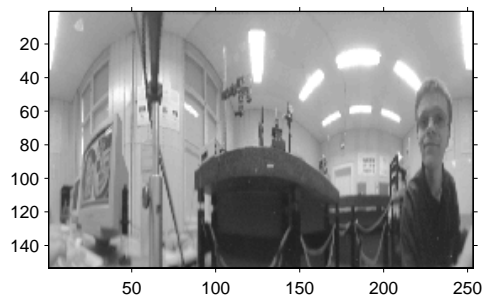
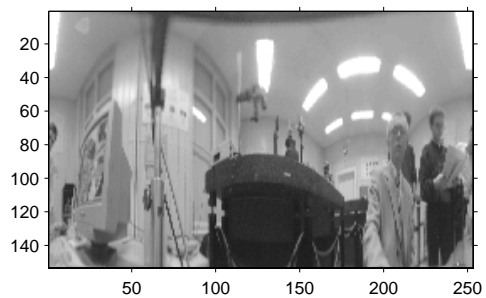


spheric. mirror

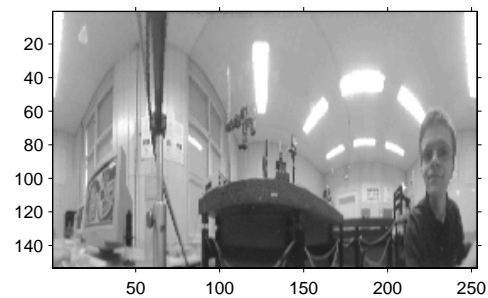
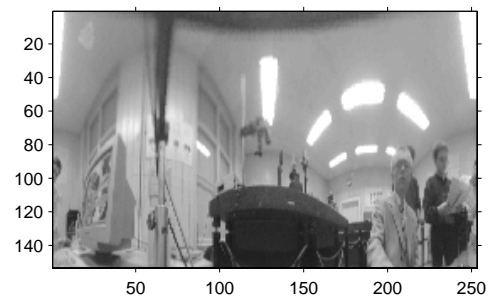
hyperb. mirror



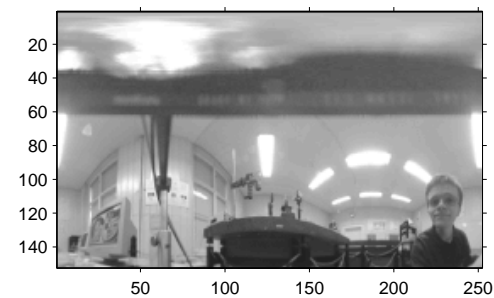
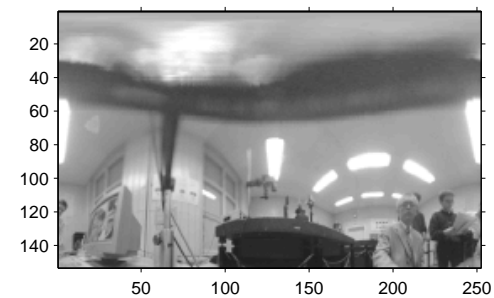
square root



logarithm

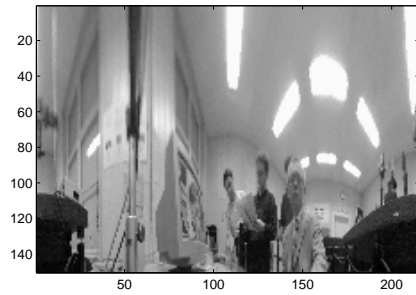


SVAVISCA

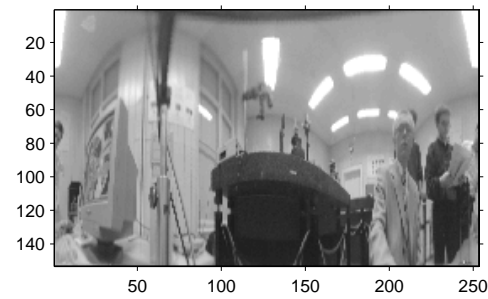




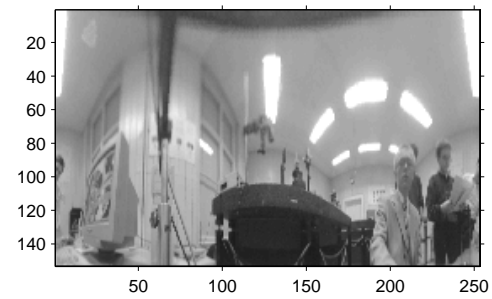
geom. correct



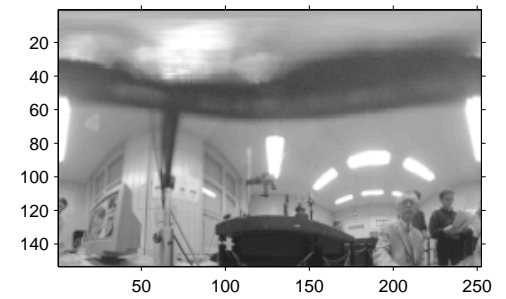
square root



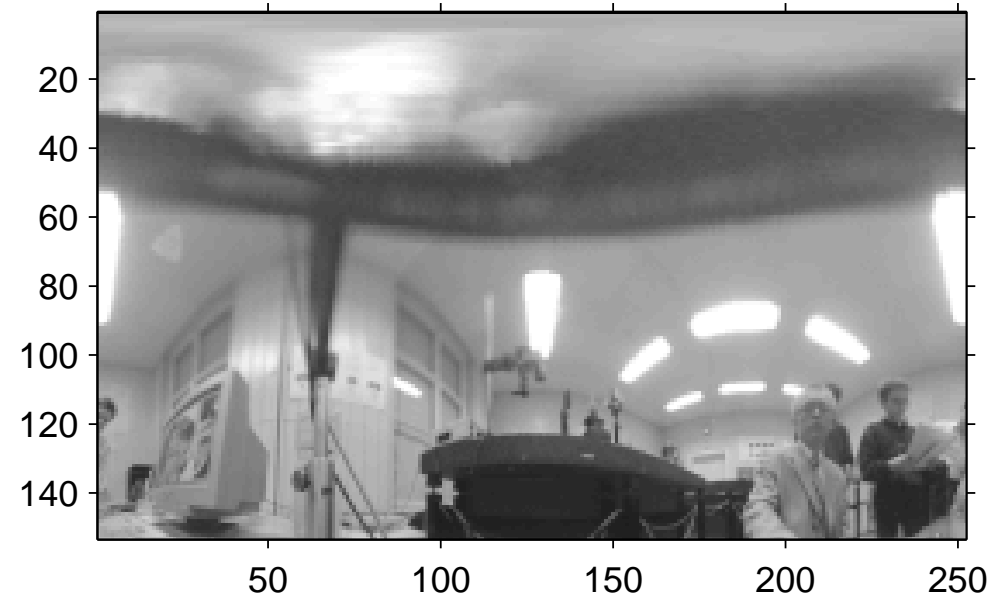
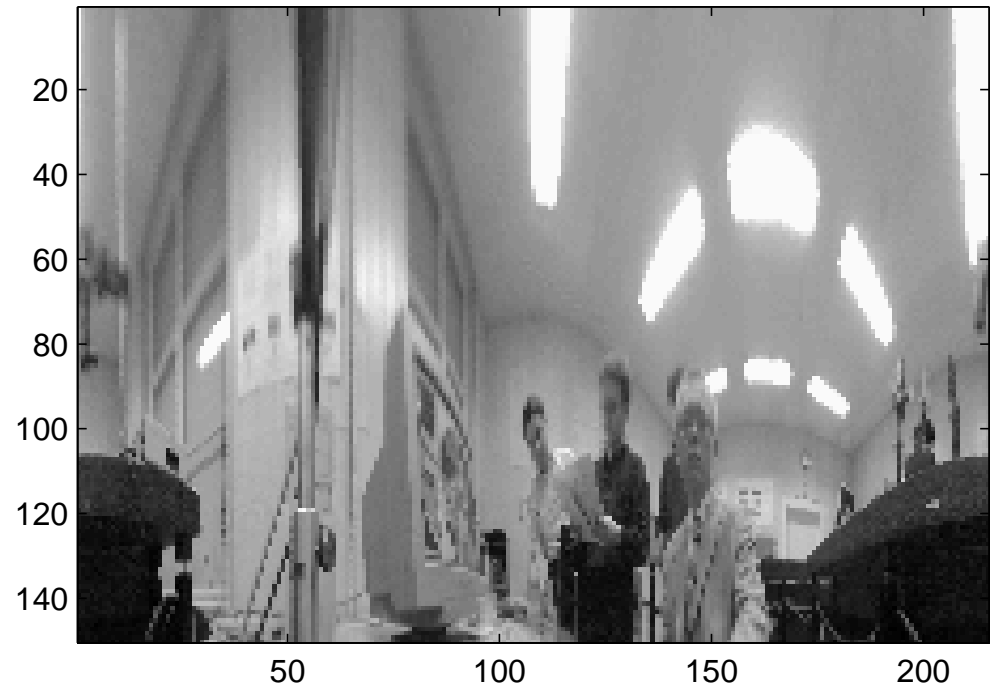
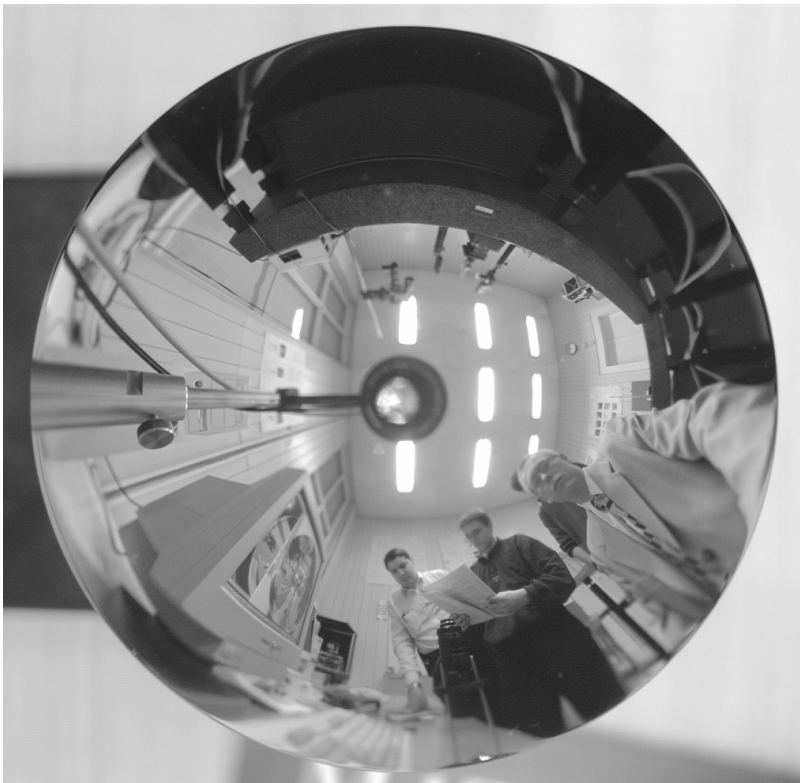
logarithm



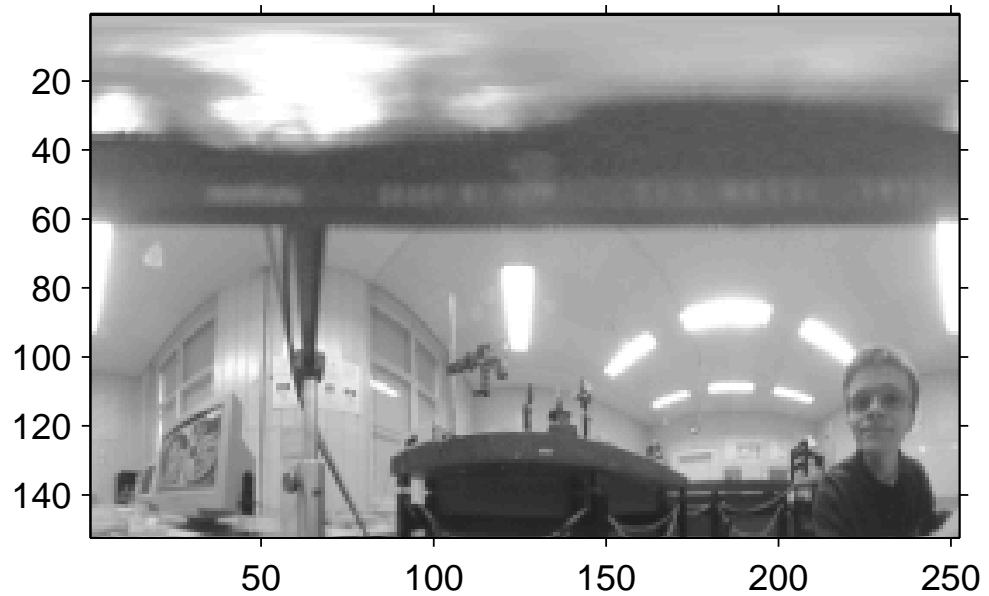
SVAVISCA



# Resampled images of real scene - geometrical + SVAVISCA



# Resampled images of real scene - SVAVISCA



## Mirror design

1. The mirror occupies only a small part of the image  
- not bigger than the fovea!
2. Constant angular resolution!
3. ?????????? radial resolution!
4. Experiment with the SVAVISCA camera and the existing mirrors must be done before doing the design!

## Applications

1. Low resolution virtual tele-presence cameras possible!
2. Image based orientation of mobile robots possible!
3. Motion detection for surveillance possible!