Panoramic Imaging with SVAVISCA Camera - Simulations

Tomáš Pajdla

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

Hadas Roth

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
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

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-presentation cameras possible!

2. Image based orientation of mobile robots possible!

3. Motion detection for surveillance possible!