Übung 7 – Mensch-Maschine-Interaktion 2

Exercise 7: Information Visualization: Visualizing Focus and Context
(Per-group homework, 2 weeks)

Tasks
a) Implement a lens and a fisheye view on the basis of the given prototype ImageFrame.java.
b) Add a second slider to adjust the magnification factor (optional).

Hints
Compile and run the prototype which is available on the MMI2 web page:
[http://www.medien.ifi.lmu.de/fileadmin/mimuc/mmi2_ss05/uebung/uebung7-focus.zip](http://www.medien.ifi.lmu.de/fileadmin/mimuc/mmi2_ss05/uebung/uebung7-focus.zip)
Example pictures are included. A large example picture is available as
[http://www.medien.ifi.lmu.de/fileadmin/mimuc/mmi2_ss05/uebung/uebung7-panorama.jpeg](http://www.medien.ifi.lmu.de/fileadmin/mimuc/mmi2_ss05/uebung/uebung7-panorama.jpeg)
(You may need to invoke java with the -Xmx256m switch to avoid out of memory errors.)

Start with the implementation of the lens view. The lens is just a quadratic area on the screen which magnifies the area of the picture where the last mouse click occurred.

To implement the fisheye view, use normalized coordinates. This means that the source and the destination rectangle have coordinates values in the range [-1, 1].

Use the transformation function $T(x) = (d + 1) \cdot x / (d \cdot x + 1)$. The distortion factor $d$ relates to the magnification factor $m$ by $d = m - 1$. Attention: For the implementation, the inverse transformation $T^{-1}(x)$ is needed.

The transformation function in the plane is defined by

$T_x(x, y) = T(x) \cdot (1 - y^2) + x \cdot y^2$
$T_y(x, y) = T(y) \cdot (1 - x^2) + y \cdot x^2$

Further explanations will be given in the exercises session.

Submission
- Submission is by email to mmi2.2005@hcilab.org.
- Please use a zip file attachment named uebung7-gruppeN.zip containing the java and the class files. Your solution must compile and run in the computer lab (Amalienstr. 17).
- The deadline for submission is Friday, July 1st 2005, 8 a.m.