<u>Übung 7 – Mensch-Maschine-Interaktion 2</u>

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
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
(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.**