Name:	First name:	Matr.–Nr.:
Technische Unive Fakultät für Nassir Navab, Se	Informatik	SoSe 2007 Januar 12, 2007

Questionnaire in 3D Computer Vision for Special Effects

This short questionnaire was designed to support the team building process in the lab course 3D computer vision for special effects. The results of this questionnaire will not influce your final grade in any way. However, to be able to participate in a group that will take special assignments on video augmentation you will have to prove your knowledge in the field. The participation in this special groups doing more assignments is voluntary once you achieved the required credits within this questionnaire. Please do the questionnaire yourself and mention the time and material you needed.**Good Luck!**

PART 1: About Yourself

Andreas Hofhauser, Pierre Georgel & Martin Horn

Email		Birthdate	
Major	Minor		Semester
Personal Study history of relevant	couses:		
3D Computer Vision (Prof. Nava Basic Mathematical Tools for Im Computer Graphik (Prof. Wester Augmented Reality I (Prof. Klin Augmented Reality II (Prof. Klin Image Processing (Prof. Radig) Methoden der industriellen Bildw Other relevant Lectures, Lab Cou	b) aging and Visu mann / Dr. Kip ker) ker) erarbeitung (D	ofer) r. Steger)	or SEPs:

Desired Team Members (max. 2)

How long did you need to answer this questionnaire? (fill in once you finish this questionnaire)

What material did you use? (fill in once you finish this questionnaire)

I would like to participate in the advanced team

PART 2: Programming Skills

Please rank your skills in programming and appliactions here. 1 means you are an expert in that field . 6 means you do not know the language or application at all. Please be reminded, that this is not a test nor an evaluation of your skills with the objective to form your grade, but to build reasonable teams and create moderate exercises.

Programming Languages: (1=expert, 6=do not know this)	1	2	3	4	5	6
Matlab						
Maple						
C++						
С						
Java						
HTML						
Libraries and APIs	1	2	3	4	5	6
Matlab Optimization Toolbox						
Matlab Image Processing Toolbox						
HALCON						
OpenGL						
OpenCV						
OpenInventor						
OpenInventor						
Openniventor						
Applications, Compiler and IDEs:	1	2	3	4	5	6
Applications, Compiler and IDEs: GCC	1	2	3	4	5	6
Applications, Compiler and IDEs: GCC Visual Studio .NET		2	3	4	5	6
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop			3	4	5	6
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop			3	4	5	6
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop Adobe After Effects			3			6 0 0 0 0 0 0 0 0 0 0 0 0 0
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop Adobe After Effects Adobe Premiere					5	
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop Adobe After Effects Adobe Premiere Max3D			3		5	6 0 0 0 0 0 0 0 0 0 0 0 0 0
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop Adobe After Effects Adobe Premiere Max3D Blender			3		5	6
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop Adobe After Effects Adobe Premiere Max3D Blender Maya						
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop Adobe After Effects Adobe Premiere Max3D Blender Maya Combustion						
Applications, Compiler and IDEs: GCC Visual Studio .NET KDevelop Adobe Photoshop Adobe After Effects Adobe Premiere Max3D Blender Maya						

PART 3: Background Knowledge in 3D Computer Vision and Image Processing

- a) List all properties of a 3D Rotation Matrix you know:
- b) Here are some examples of homogeneous point. Please complete the equal(=) or not equal(≠) signs.

$$\begin{pmatrix} 1\\1\\1\\2 \end{pmatrix} \quad \begin{pmatrix} 2\\2\\2\\1 \end{pmatrix}, \quad \begin{pmatrix} 0.1\\0.05\\0.2\\2 \end{pmatrix} \quad \begin{pmatrix} 1\\0.5\\2\\20 \end{pmatrix}, \quad \begin{pmatrix} 1\\2\\2\\1 \end{pmatrix} \quad \begin{pmatrix} 0\\1\\1\\0 \end{pmatrix}, \quad \begin{pmatrix} 4\\-20\\8\\4 \end{pmatrix} \quad (-5,25,-10,-5)^T)$$

c) Give the definition of expectation E[x] and variance Var[x] for a gaussian distribution:

- d) What is a image histogram?
- e) Give the definition of an edge in an image? What will be a good choice for a discrete filter to compute them.
- f) Write down the general form for an affine (T_{aff}) and projective (T_{proj}) 3D transformation:
- g) What is the dimension and rank of a fundamental matrix?
- h) What is the DLT? Describe the algorithm.
- i) Rotate a point p with quaternion q? What is a quaternion?