

Computergrafik SS 2004

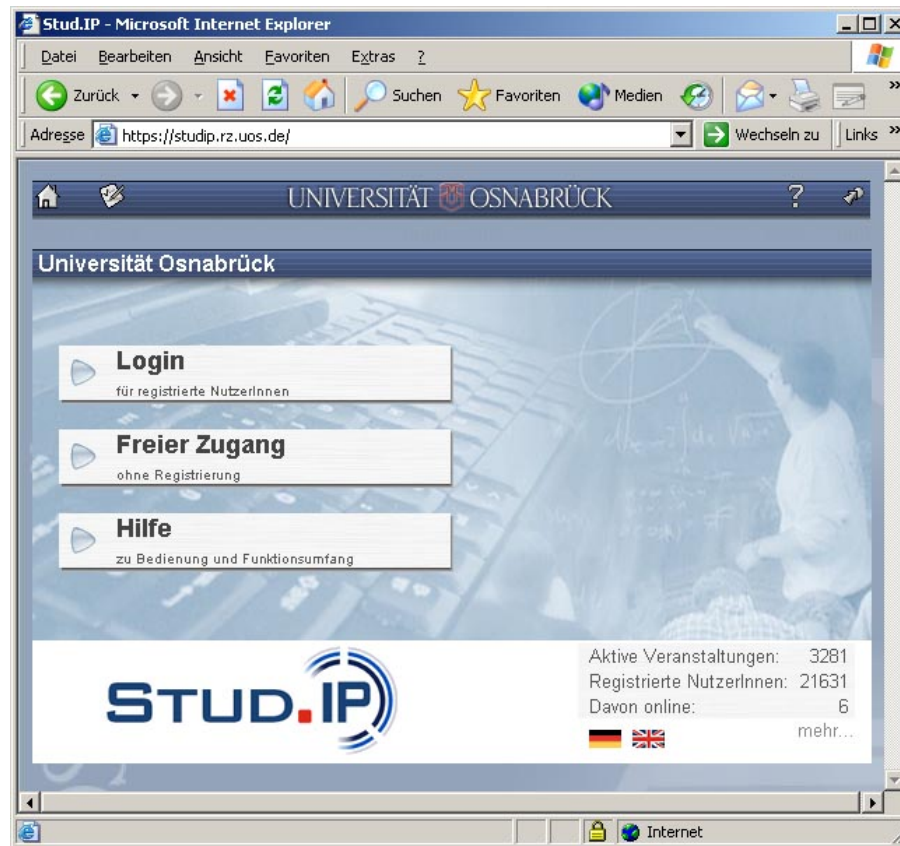
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Ralf Kunze

Institut für Informatik
Universität Osnabrück

Organisation

- Vorlesung: MO+DI, 14:15 Uhr, 31/449a
- Übung: DO, 12:30 + 14:15 Uhr, 31/449a
- Übungsblatt am Dienstag
- Übung am Donnerstag
- Testat am Montag, Dienstag, Mittwoch
- Klausur zu Semesterende

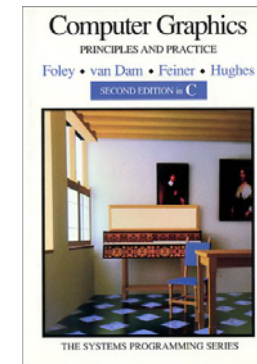
stud.ip



<https://studip.rz.uos.de/>

Literatur

- Dieter Fellner:
Computergrafik
BI 1994 (Springer 2004)
- James Foley et al:
*Computer Graphics:
Principles and Practice*
Addison Wesley, 1995
- Klaus Zeppenfeld:
*Lehrbuch der
Grafikprogrammierung*
Spektrum 2004



Begleitmaterial

- Skript in HTML
- Skript in PDF
- Folien in PDF
- Mitschnitt als RealVideo

<http://www-lehre.inf.uos.de/~cg/2004>

Motivation

- Bild sagt mehr als 1000 Worte
- Auge erfasst 40.000.000 Bit/sec
- Lesegeschwindigkeit
= 10 Worte à 5 Zeichen/sec
= $10 \cdot 5 \cdot 8 = 400$ Bit/sec
- $\Rightarrow$ Faktor 100.000

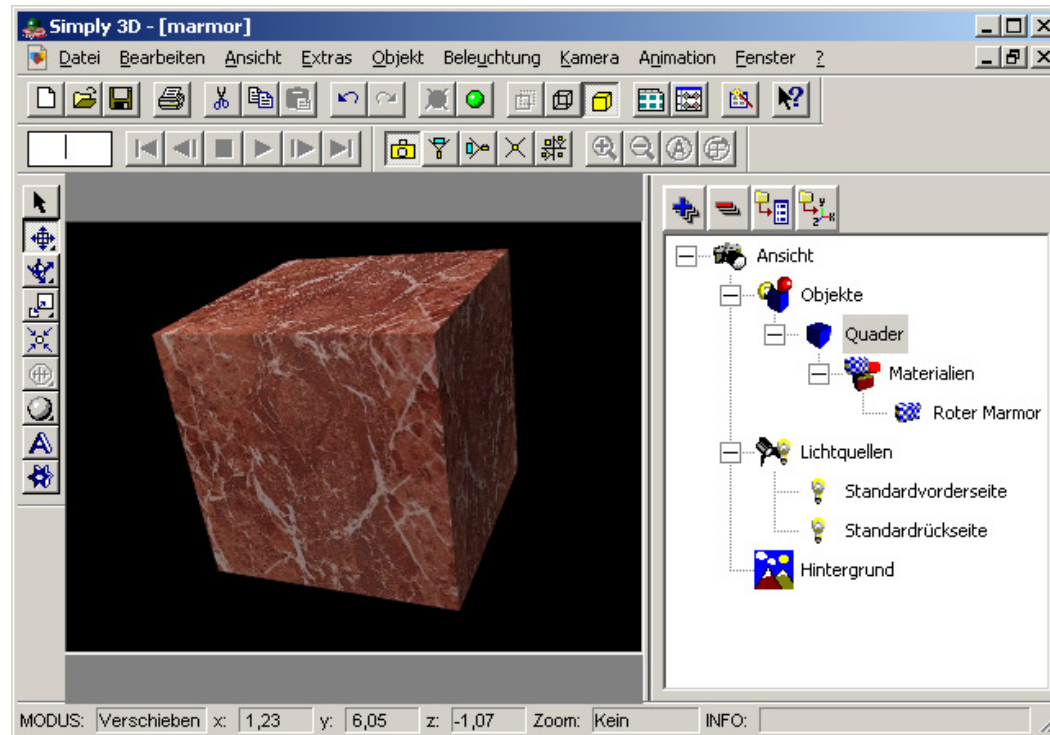
Grafische Datenverarbeitung

- Bildverarbeitung
 - Veränderung
 - Vereinfachung, Verbesserung
- Mustererkennung
 - Optical Character Recognition
 - Analyse von Luftbildern
- Generative Computergrafik
 - Eingabe der Repräsentation
 - Ausgabe der Darstellung

Anwendungen

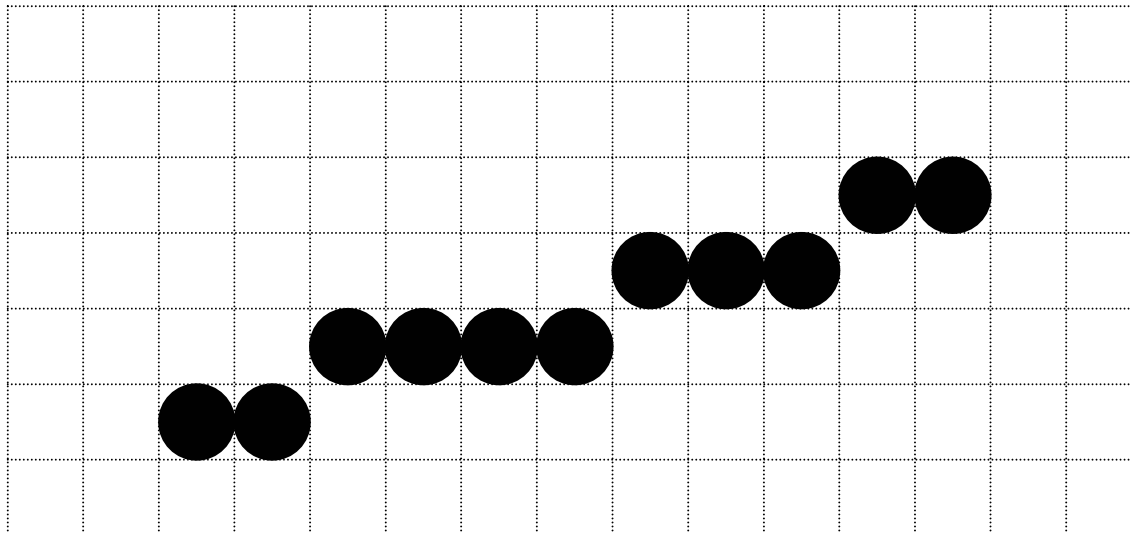
- Business-Grafik
- Grafische Benutzeroberflächen
- Kartografie
- CAD (Haus, Auto,...)
- Visualisierung (Molekül, Strömung,...)
- Simulation (Fahrzeug, Flugzeug,...)
- Virtual Reality (Computerspiele,...)

Modellieren, Projizieren, Rastern

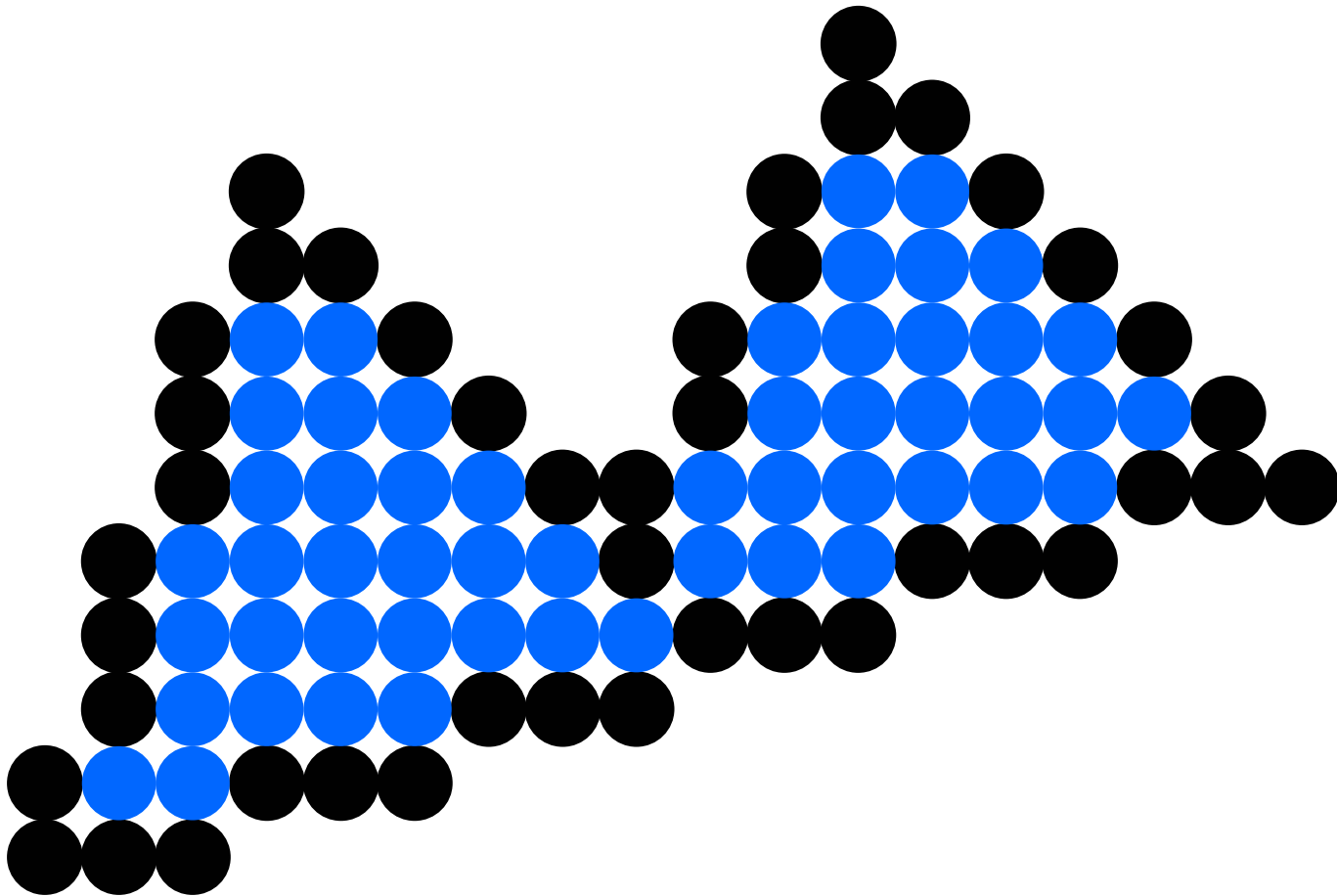


Micrografx Simply 3D

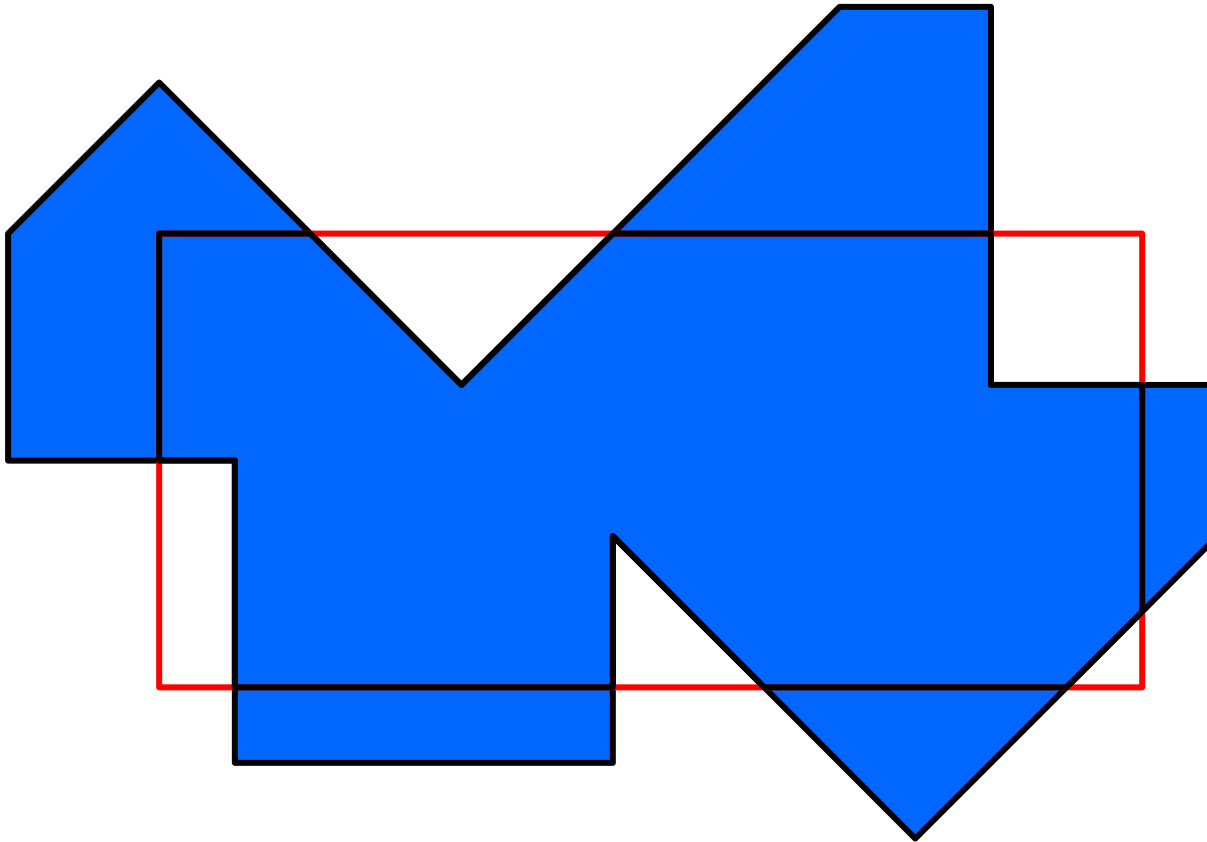
2D-Grundlagen



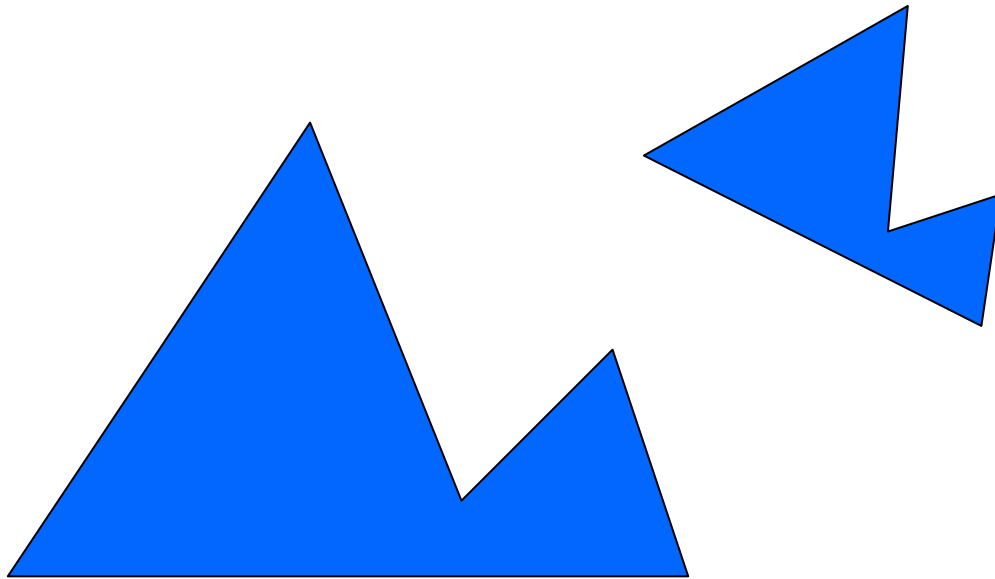
2D-Füllen



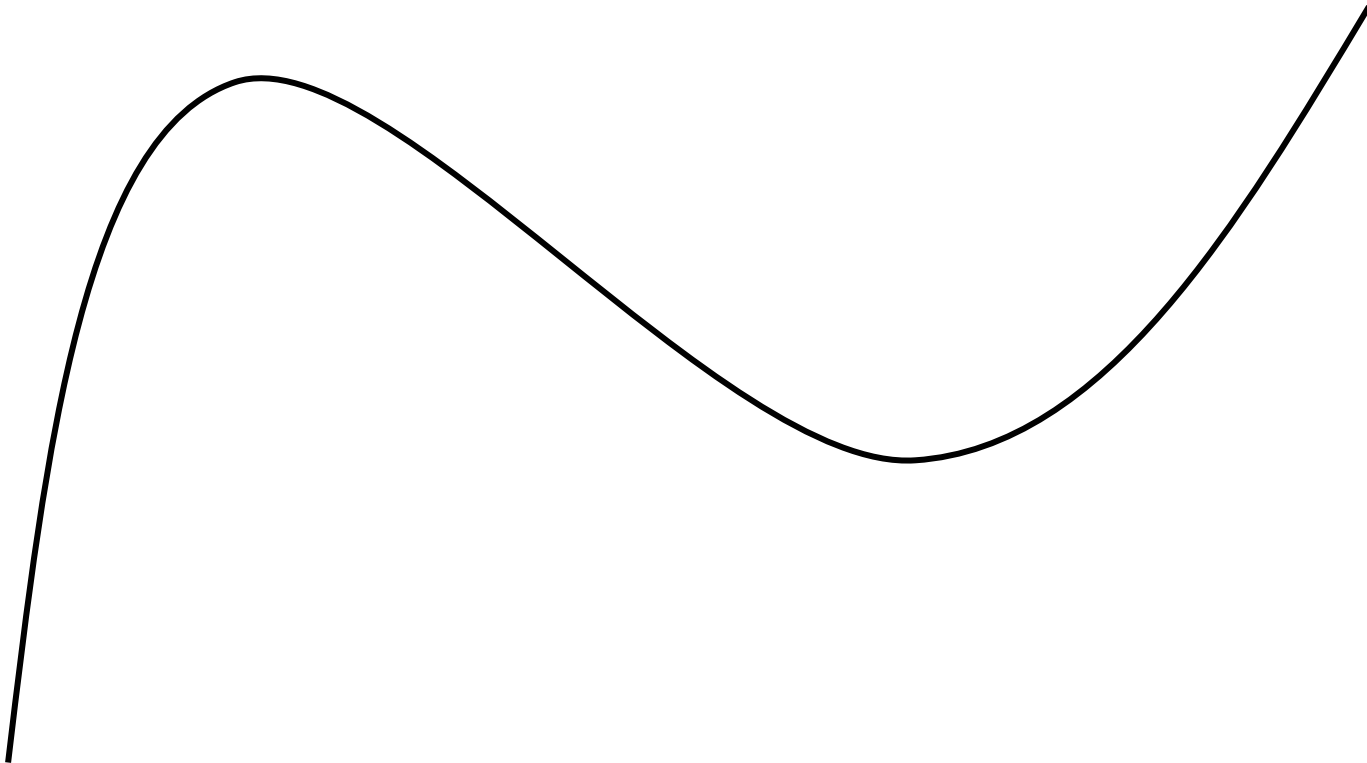
2D-Clipping



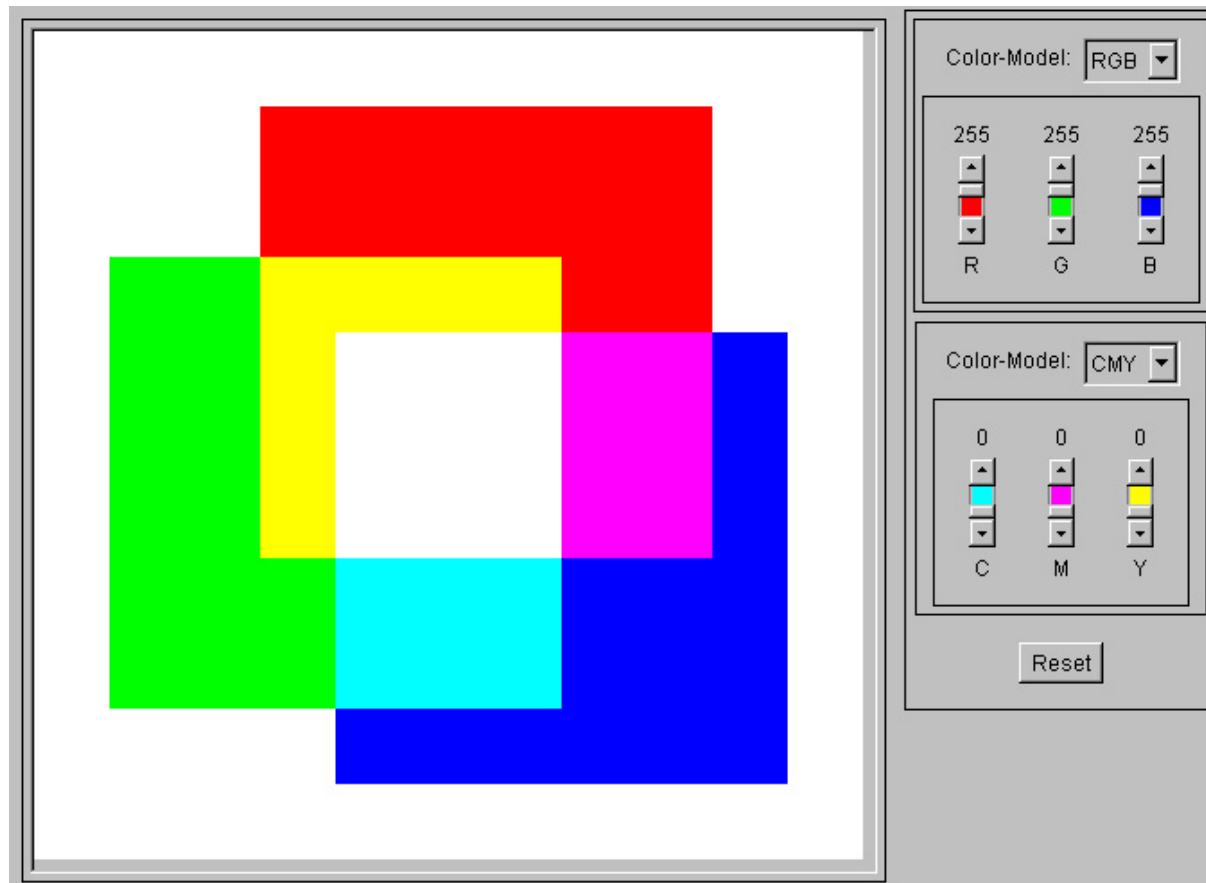
Transformation



Kurven



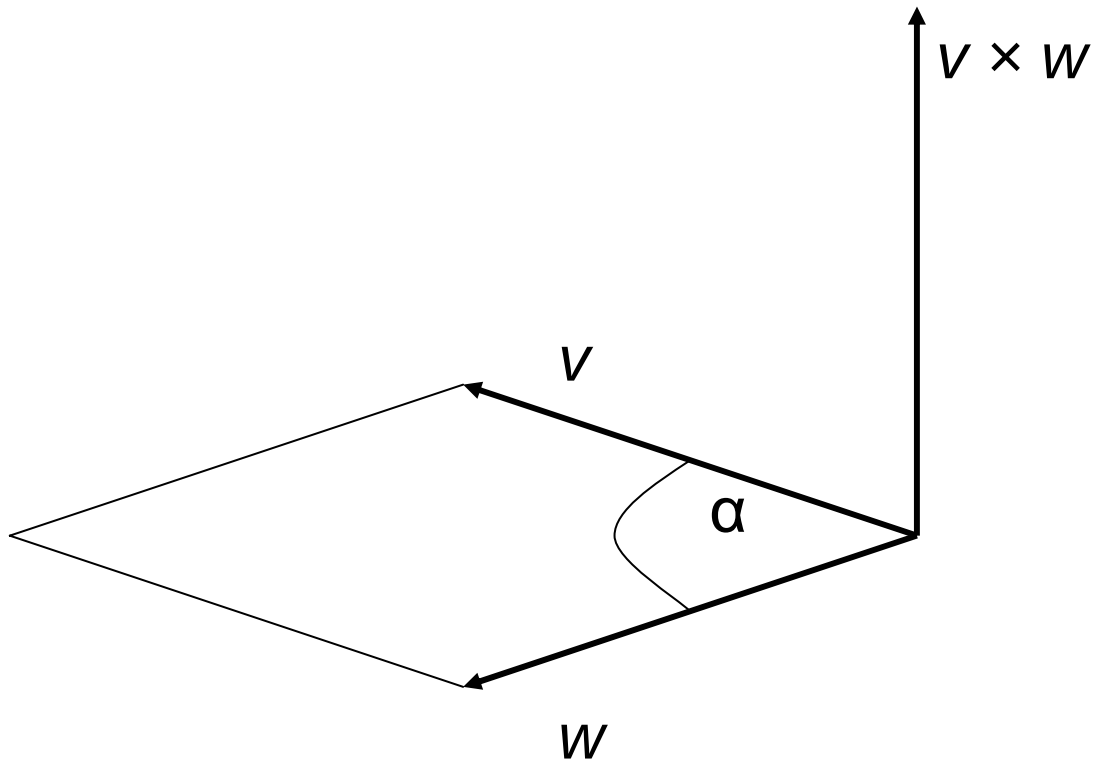
Farbe



Pixeldateiformate



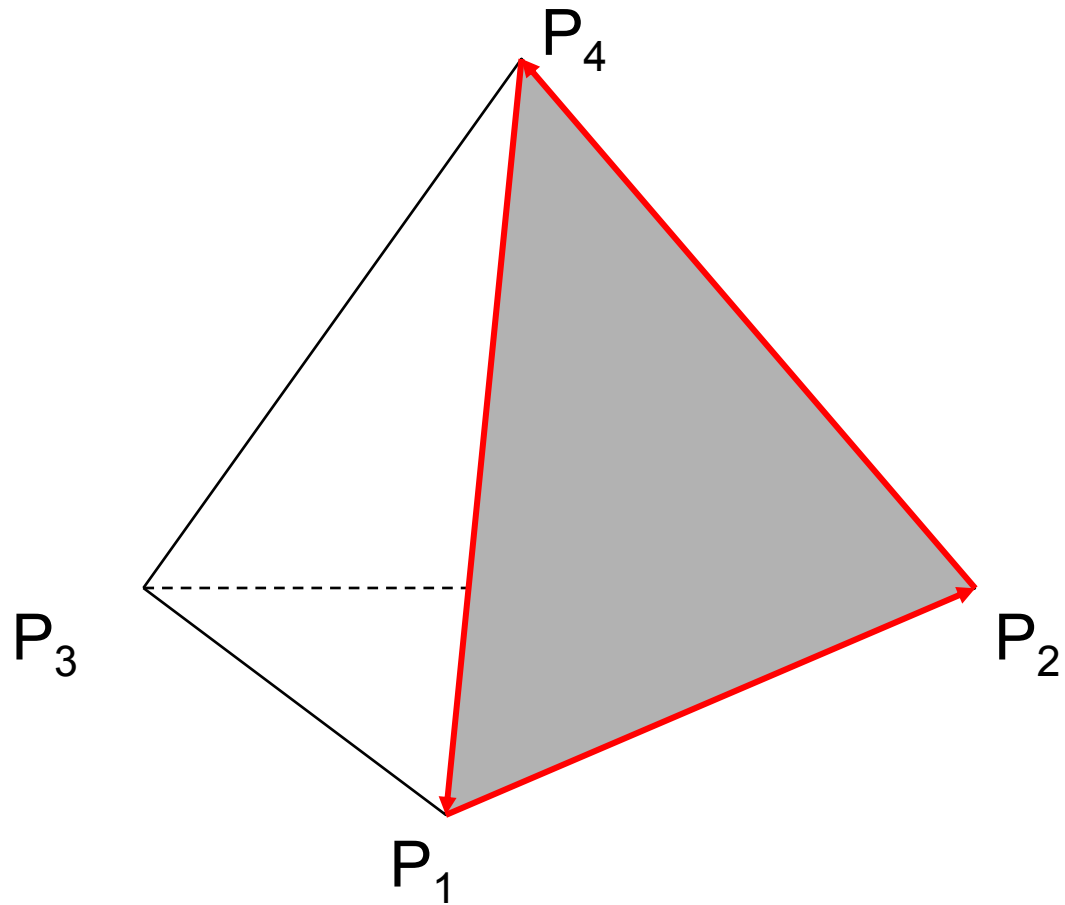
3D-Grundlagen



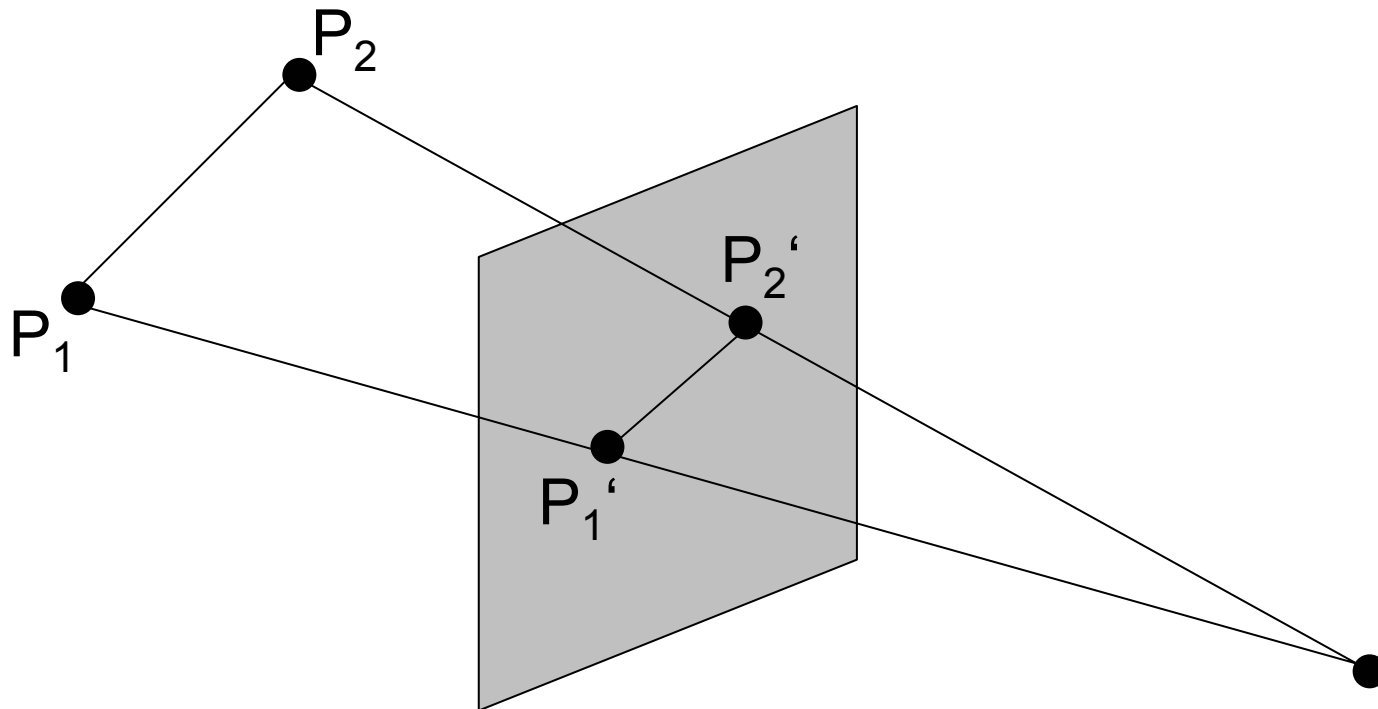
3D-Transformationen

$$R_y(\delta) = \begin{pmatrix} \cos(\delta) & 0 & \sin(\delta) & 0 \\ 0 & 1 & 0 & 0 \\ -\sin(\delta) & 0 & \cos(\delta) & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

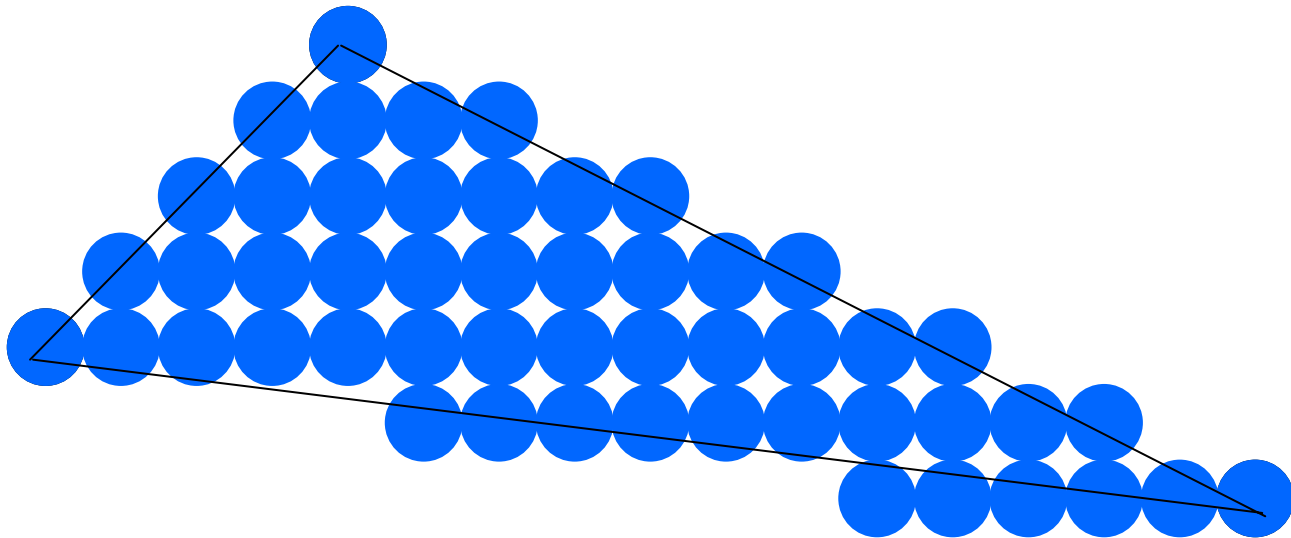
3D-Repräsentation



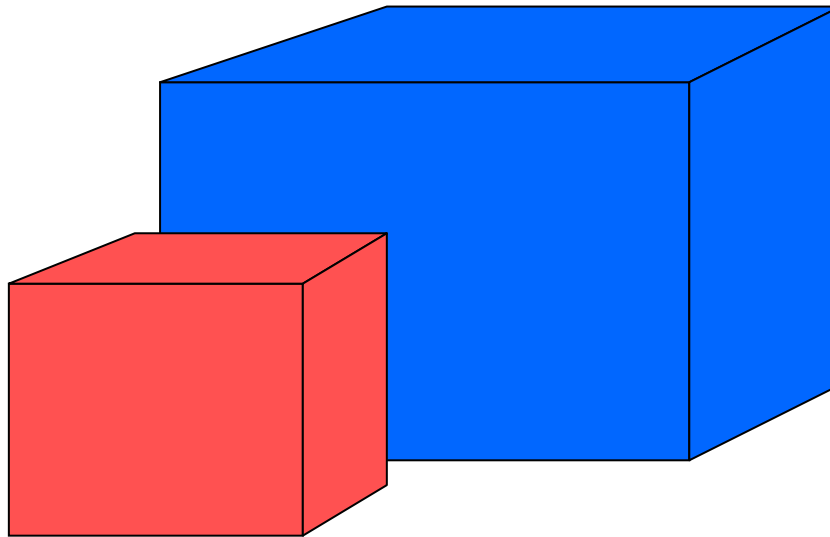
Projektion



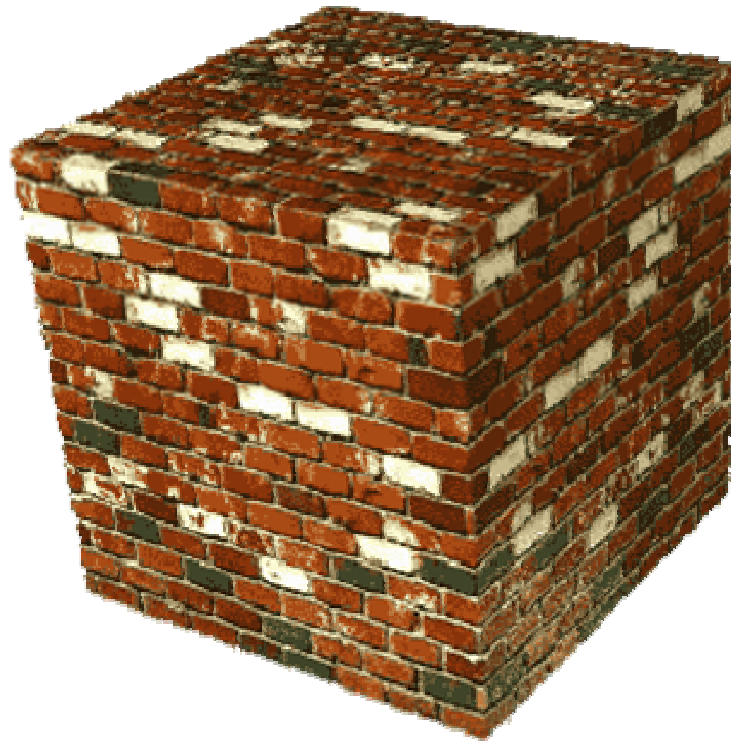
Rastern



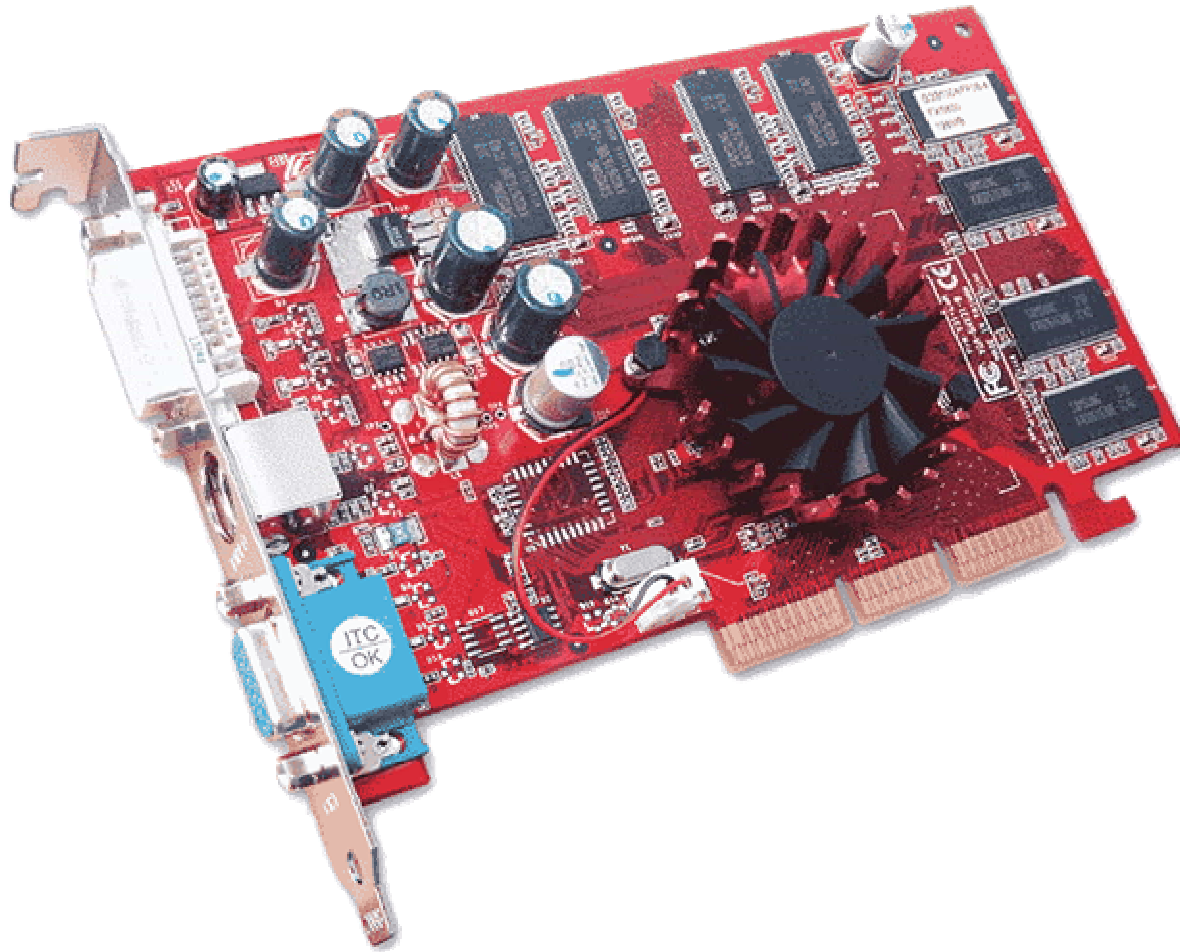
Culling



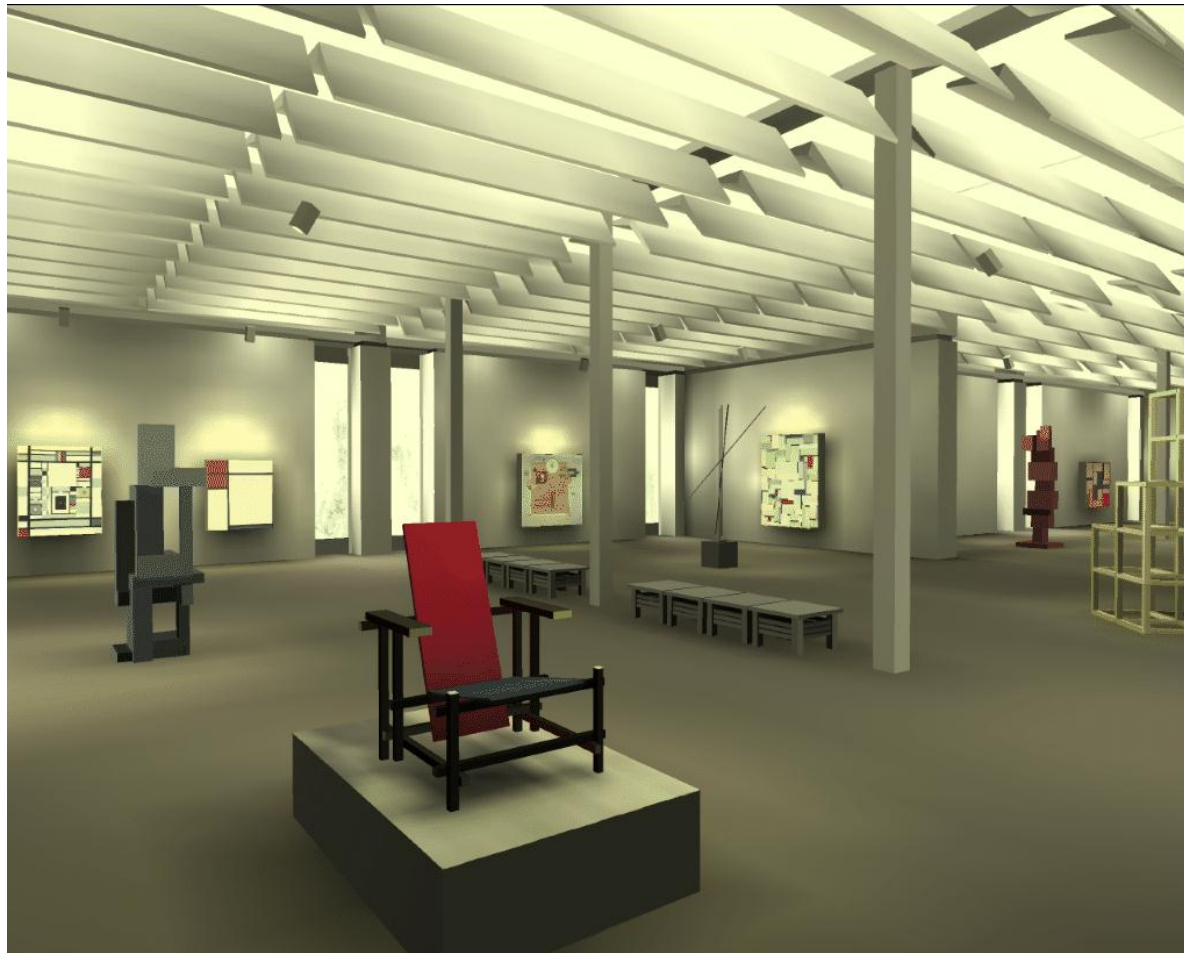
Texturing



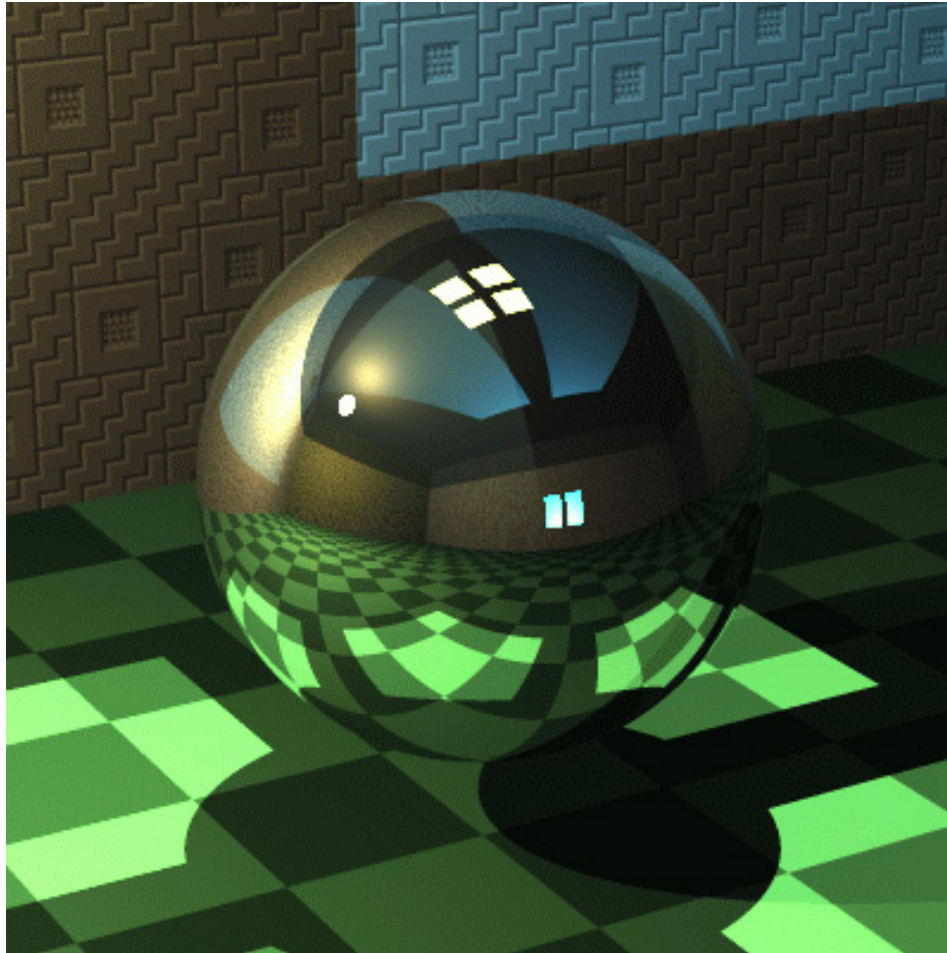
Hardwarebeschleunigung



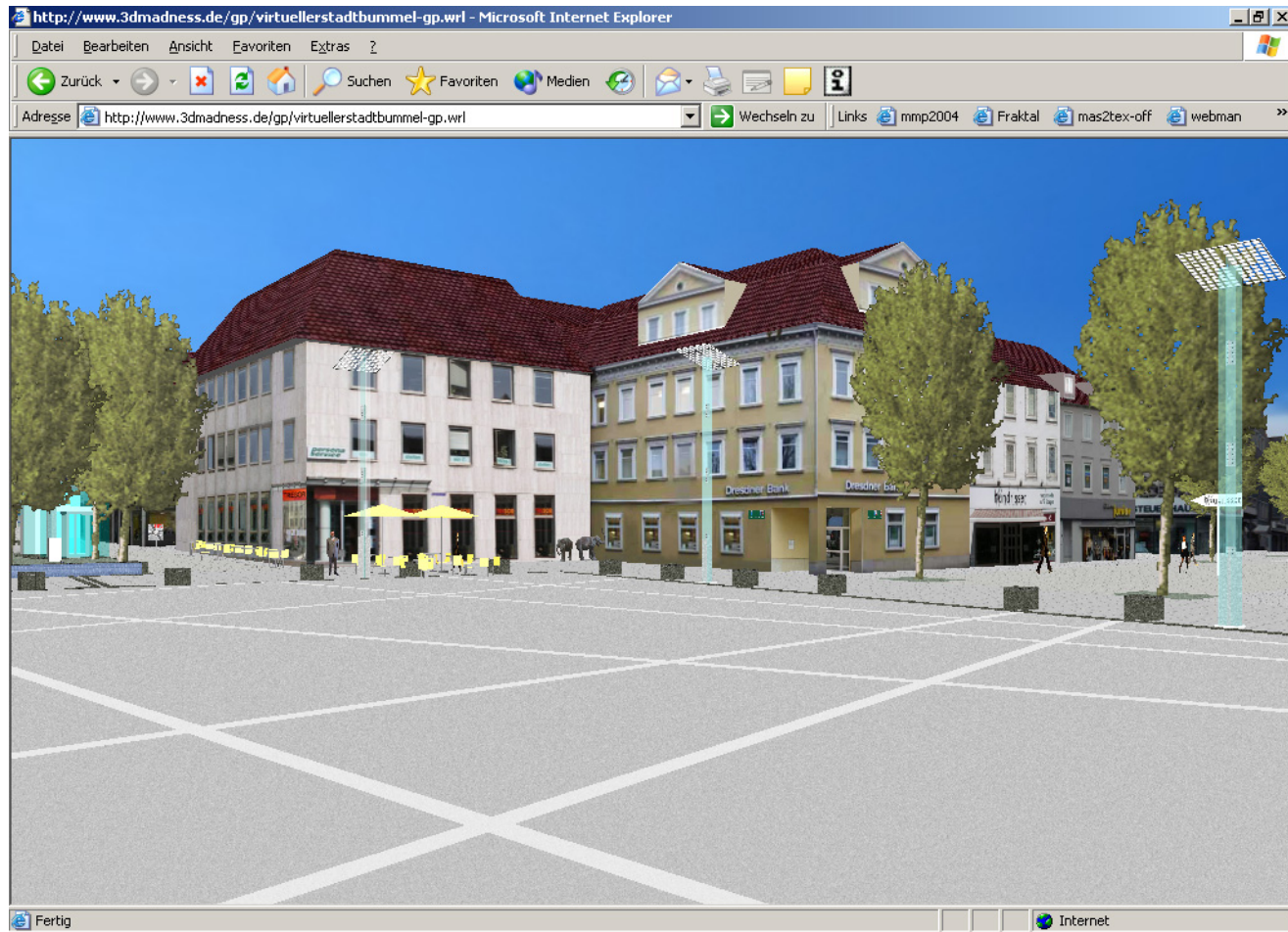
Radiosity



Ray Tracing



VRML



<http://www.3dmadness.de/gp/virtuellerstadtbummel-gp.wrl>

OpenGL

