

Computergrafik SS 2008

Oliver Vornberger

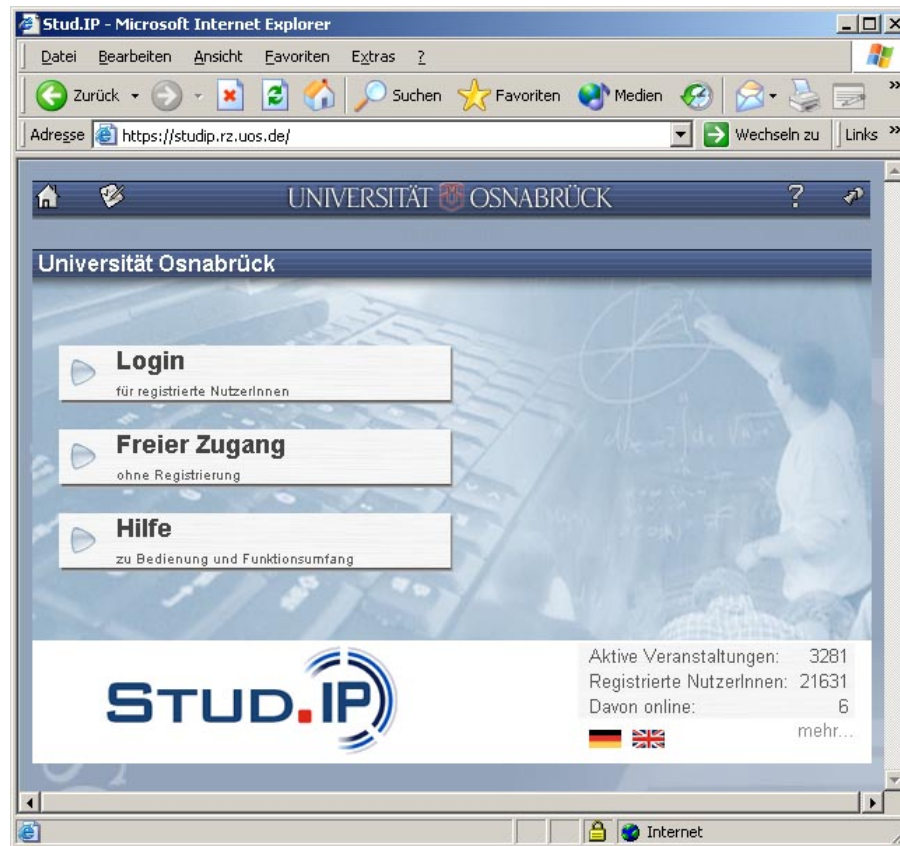
Institut für Informatik
Universität Osnabrück

7. April 2008

Organisation

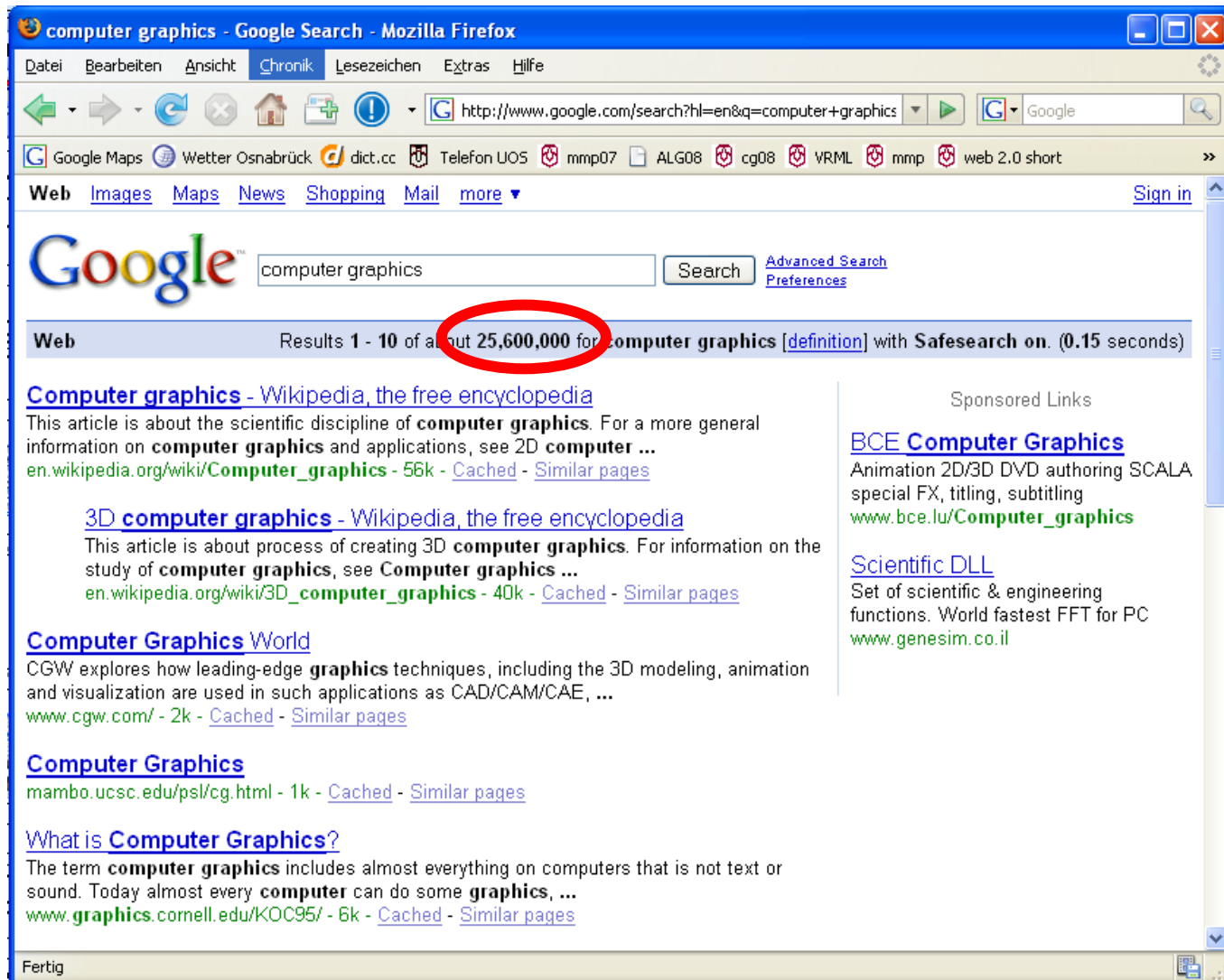
- Vorlesung: Mo+Di, 10:15 Uhr, 31/449a
- Übung: Do, 10:15 + 12:00 Uhr, 31/449a
- Übungsblatt am Dienstag
- Übung am Donnerstag
- Testate am Montag, Dienstag, Mittwoch, 31/145
- Klausur zu Semesterende

stud.ip



<https://studip.serv.uni-osnabrueck.de/>

Google



Amazon

Amazon.com: computer graphics - Mozilla Firefox

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

http://www.amazon.com/s/ref=nb_ss_gw/002-2370285-1634406?url=search-alias%3D... Google

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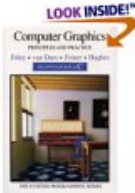
Category

- Any Category
- Books (38,490)
- DVD (1,329)
- Electronics (1,329)
- Kindle Store (484)
- Software (324)
- Apparel (260)
- Home & Garden (140)
- Video Games (62)
- Office Products (54)
- Everything Else (29)
- Musical Instruments (27)
- VHS (25)
- Music (19)
- Magazine Subscriptions (13)
- Industrial & Scientific (12)
- Unbox Video Downloads (8)
- Sports & Outdoors (6)
- Home Improvement (4)
- Health & Personal Care (3)
- Toys & Games (2)

"computer graphics"

Did you mean [3d computer graphics](#)?

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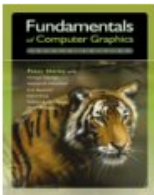
- 

Computer Graphics: Principles and Practice in C (2nd Edition) (Systems Programming Series) by James D. Foley, Andries van Dam, Steven K. Feiner, and John F. Hughes (**Hardcover** - Aug 14, 1995)

Buy new: ~~\$89.99~~ **\$71.99** 54 Used & new from **\$27.99**

Get it by **Tuesday, April 8** if you order in the next **16 hours** and choose one-day shipping. Eligible for **FREE** Super Saver Shipping.

★★★★★ (41)

Books: See all 38,490 items
- 

Fundamentals of Computer Graphics, Second Ed. by Peter Shirley, Michael Ashikhmin, Michael Gleicher, and Stephen Marschner (**Hardcover** - Jul 2005)

Buy new: ~~\$84.00~~ **\$67.20** 38 Used & new from **\$41.68**

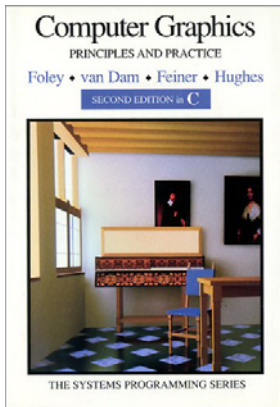
Get it by **Tuesday, April 8** if you order in the next **15 hours** and choose one-day shipping. Eligible for **FREE** Super Saver Shipping.

★★★★☆ (9)

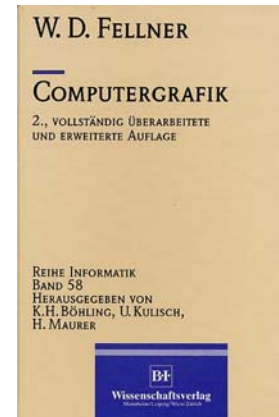
Books: See all 38,490 items

Fertig

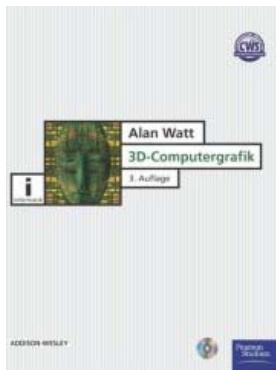
Literatur



James Foley et al:
**Computer Graphics
Principles and
Practice**
2nd Edition
Addison Wesley 1995



Dieter Fellner:
Computergrafik
BI 1994
[Springer 2009]



Alan Watt:
3D-Computergrafik
3. Auflage
Addison Wesley 2002



Klaus Zeppenfeld:
**Lehrbuch der Grafik-
programmierung**
Spektrum 2004

Begleitmaterial

- Skript, gedruckt, 7.00 €
- Skript in HTML
- Skript in PDF
- Folien in PDF
- Videomitschnitt im virtPresenter-Format
- Videopodcast im mp4-Format
- Audiomitschnitt im mp3-Format

<http://www-lehre.inf.uos.de/~cg/2008>

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

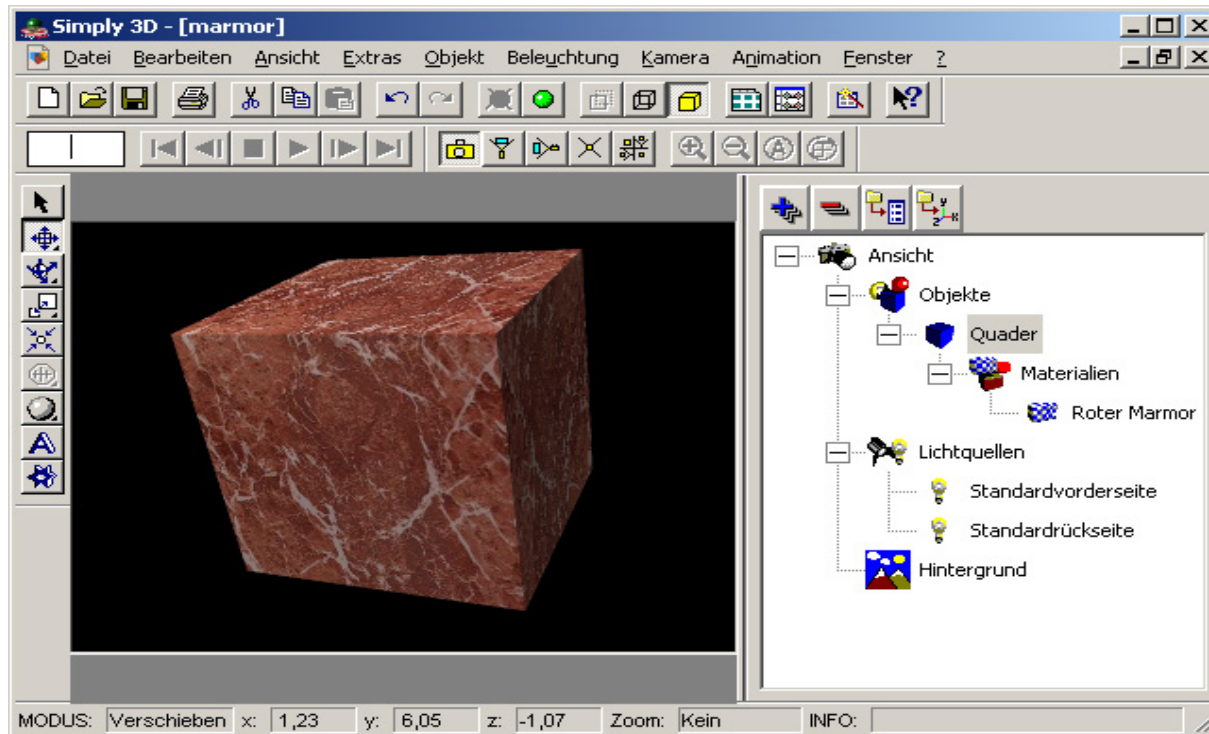
Grafische Datenverarbeitung

- Bildverarbeitung
 - Licht, Radar, Röntgen, Ultraschall, ...
 - Vereinfachung, Verbesserung
- Mustererkennung
 - Analyse von Rasterdaten
 - Optical Character Recognition (OCR)
- Generative Computergrafik
 - Eingabe der Repräsentation
 - Ausgabe der Darstellung

Anwendungen

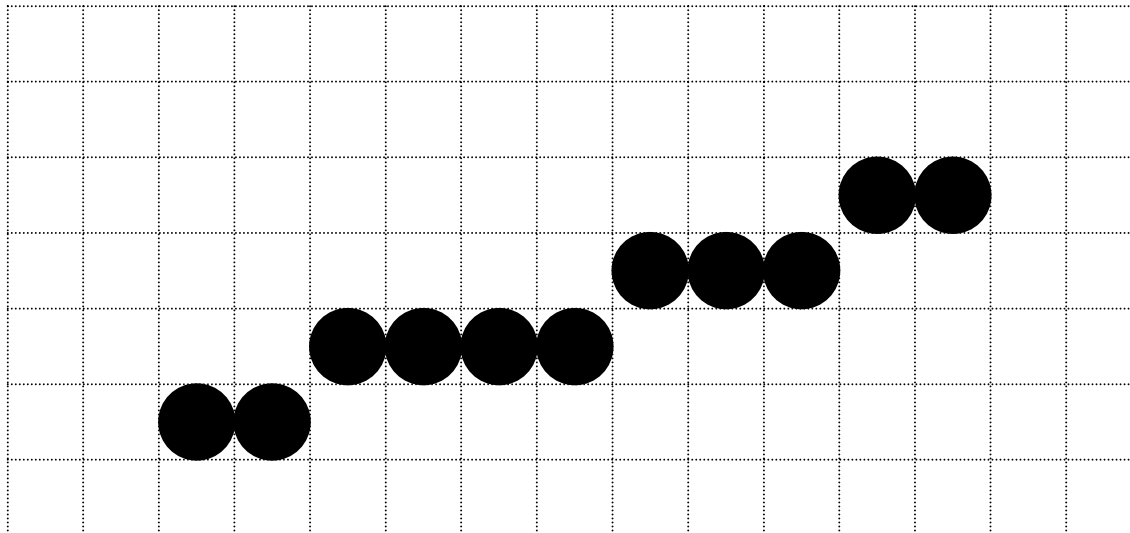
- Business-Grafik
- Grafische Benutzeroberflächen
- Kartografie
- CAD (Haus, Auto,...)
- Visualisierung (Molekül, Strömung, Scan)
- Simulation (Fahrzeug, Flugzeug,...)
- Virtual Reality (Computerspiele,...)

Modellieren, Projizieren, Rendern



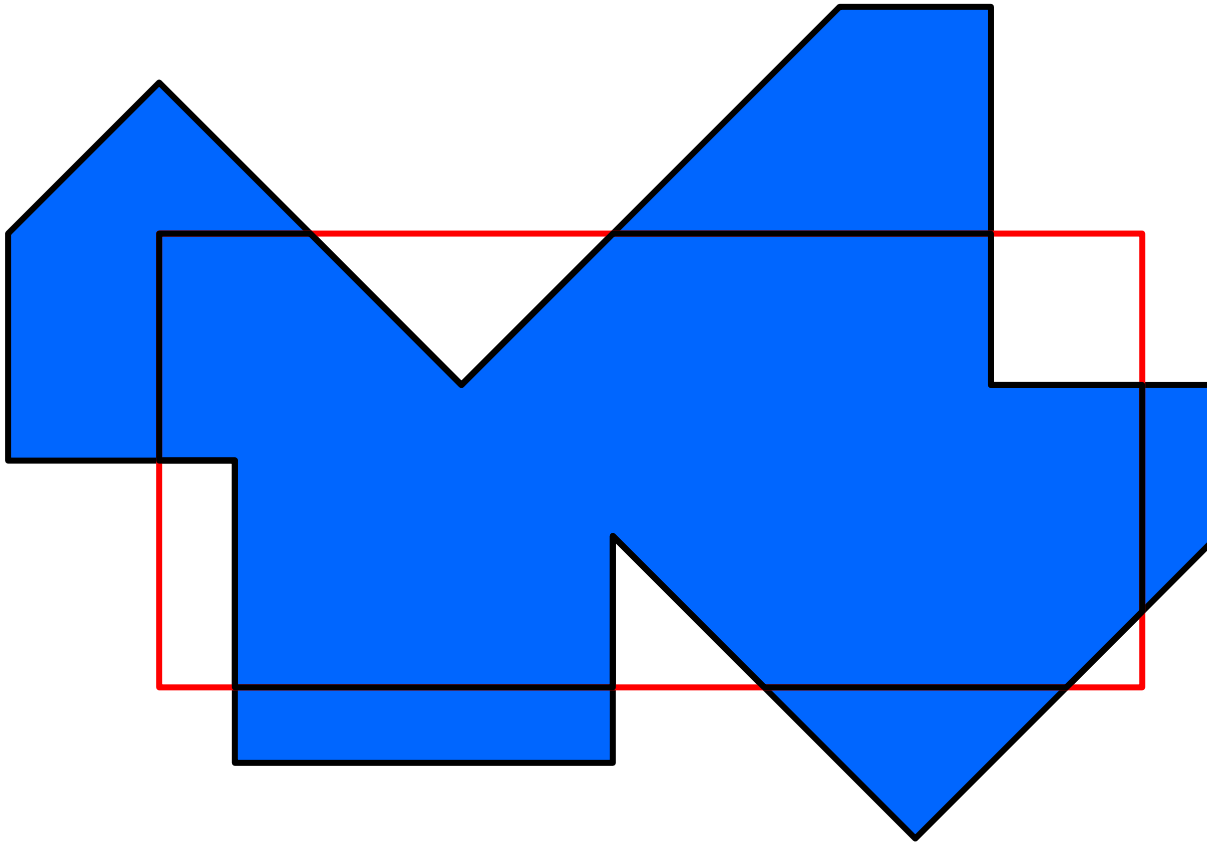
Micrografx Simply 3D

2D-Grundlagen

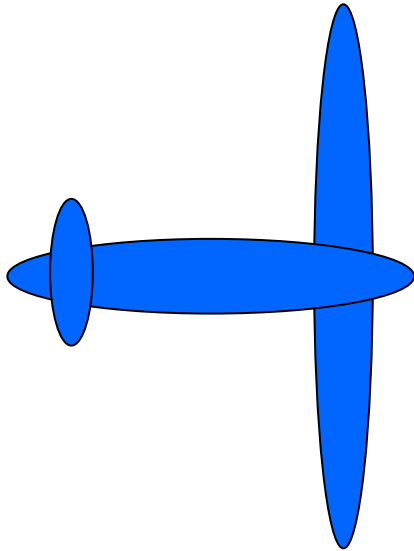


A fractal-like pattern of blue and black circles on a white background, resembling a Sierpinski triangle. The pattern consists of two main clusters of blue circles, each surrounded by black circles, forming a larger triangular shape. The blue circles are arranged in a triangular grid, with black circles filling the gaps and forming the outer boundary. The overall shape is a large triangle composed of smaller triangles, with the central triangle being white.

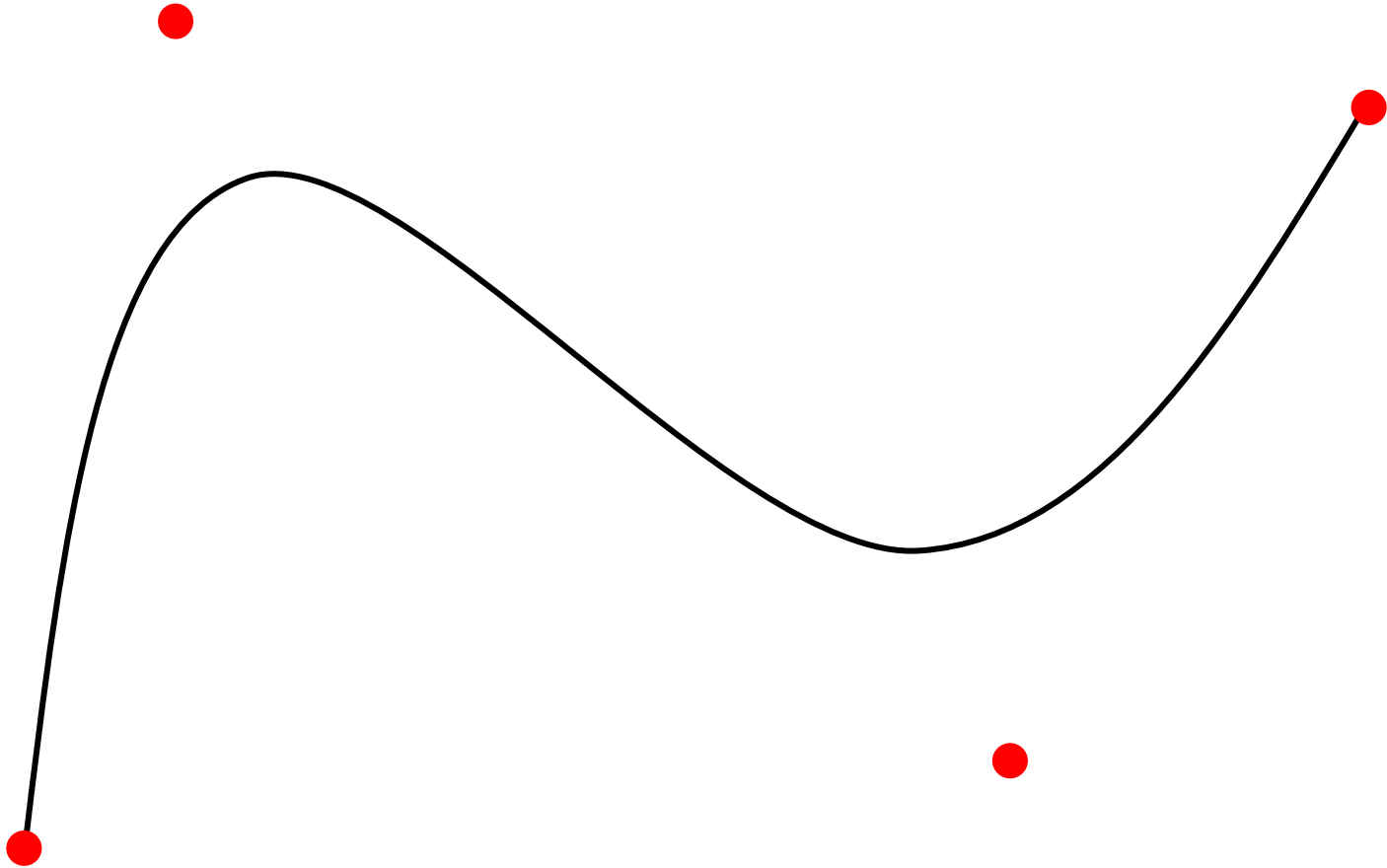
2D-Clipping



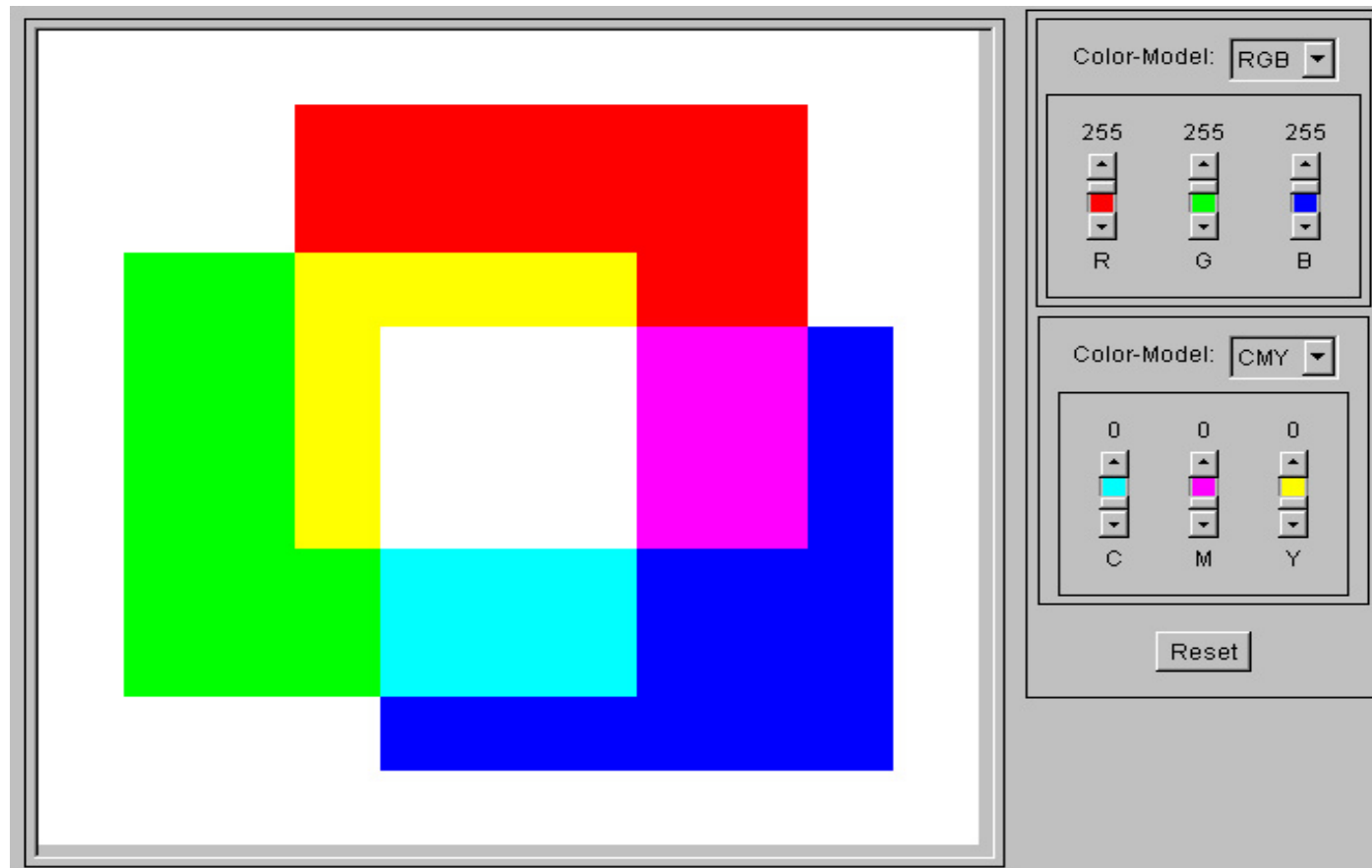
Transformation



Kurven



Farbe



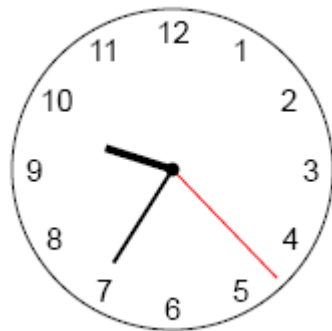
Pixeldateiformate



Macromedia Flash



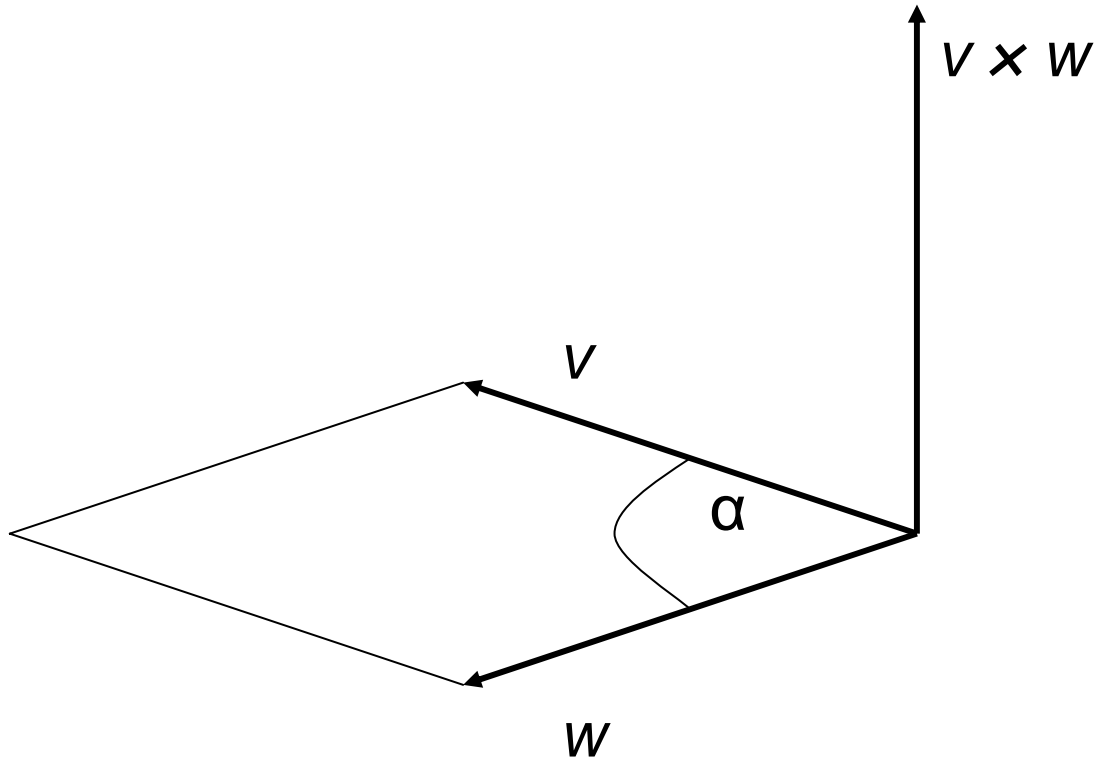
SVG



Fraktale



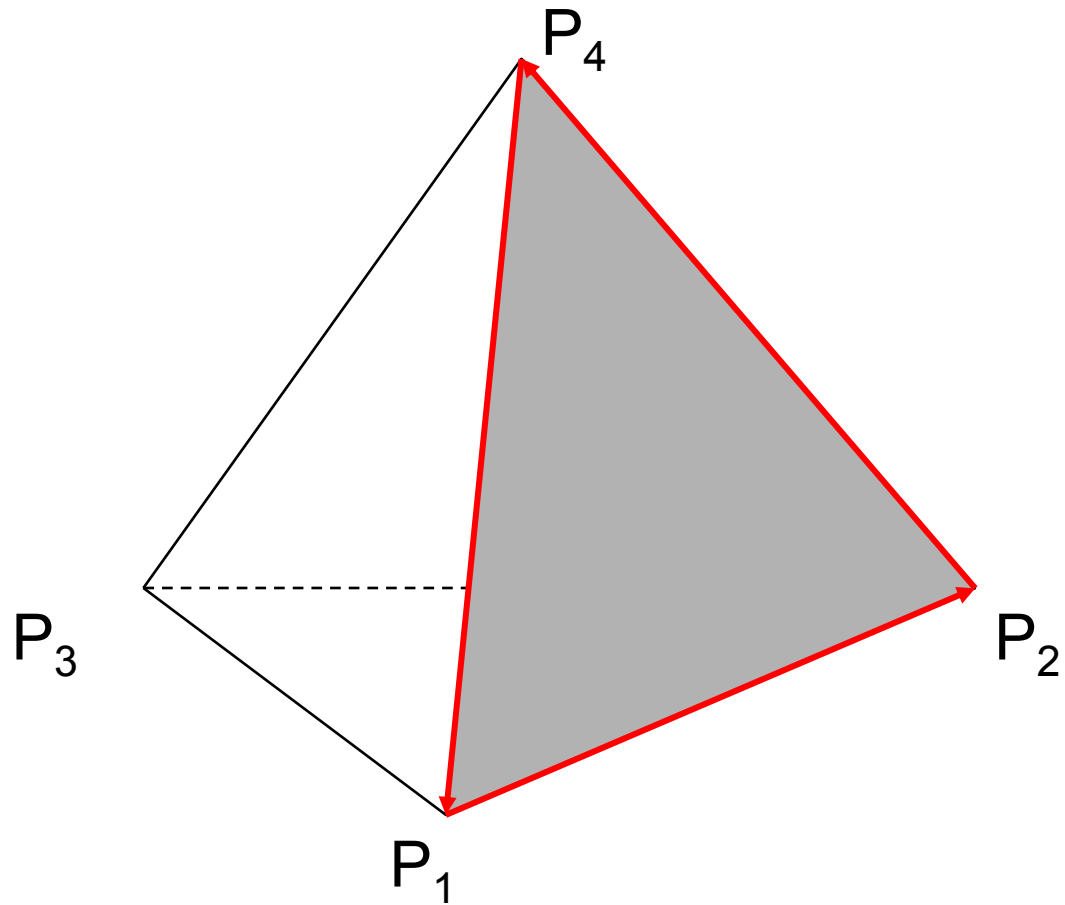
3D-Grundlagen



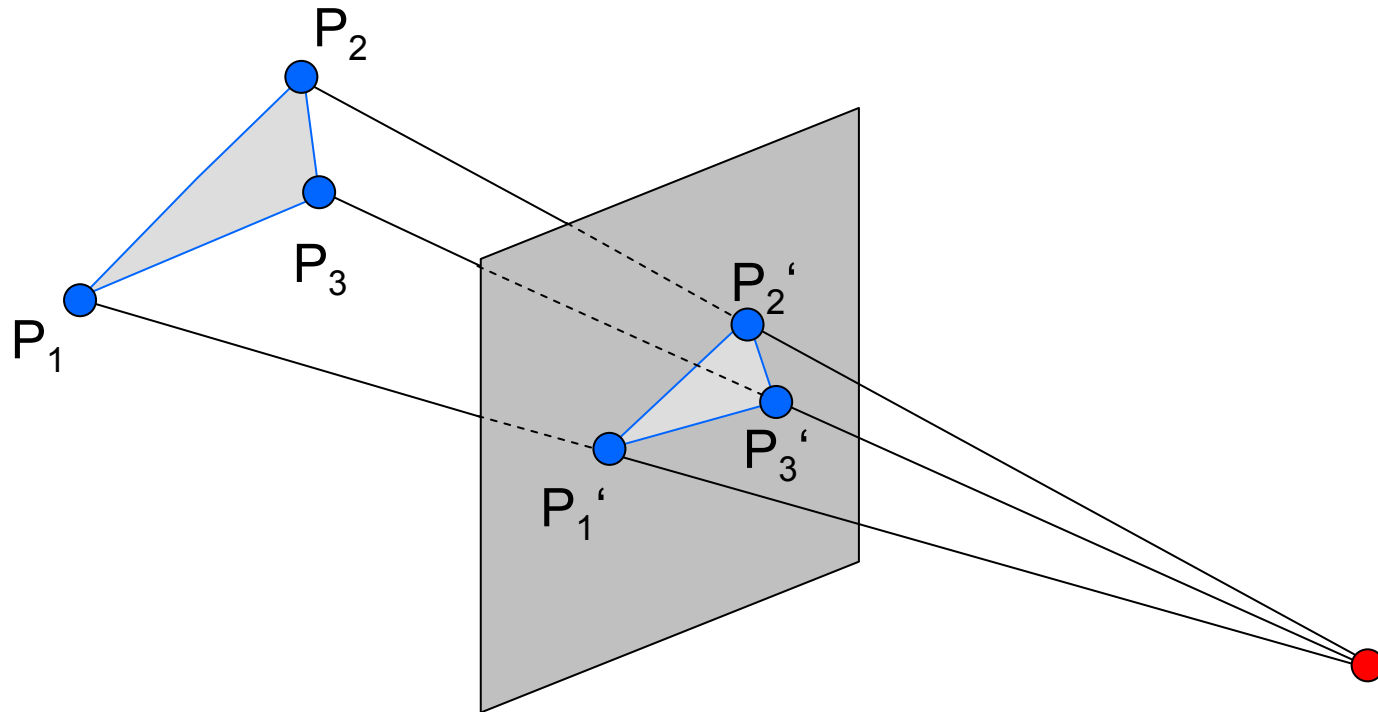
3D-Transformationen

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

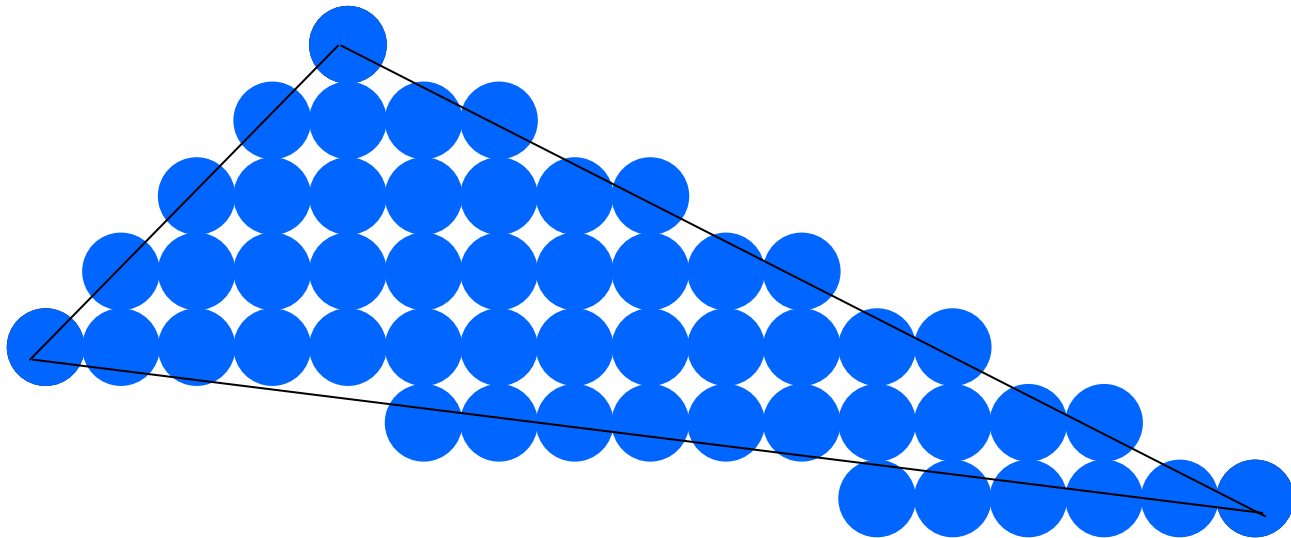
3D-Repräsentation



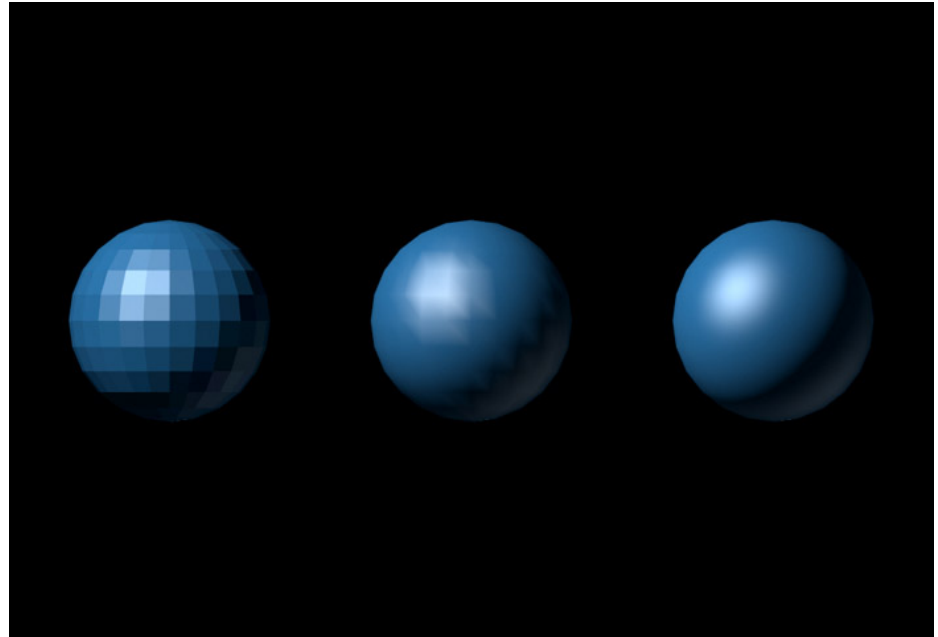
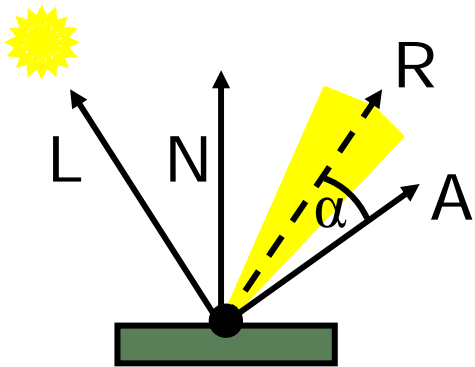
Projektion



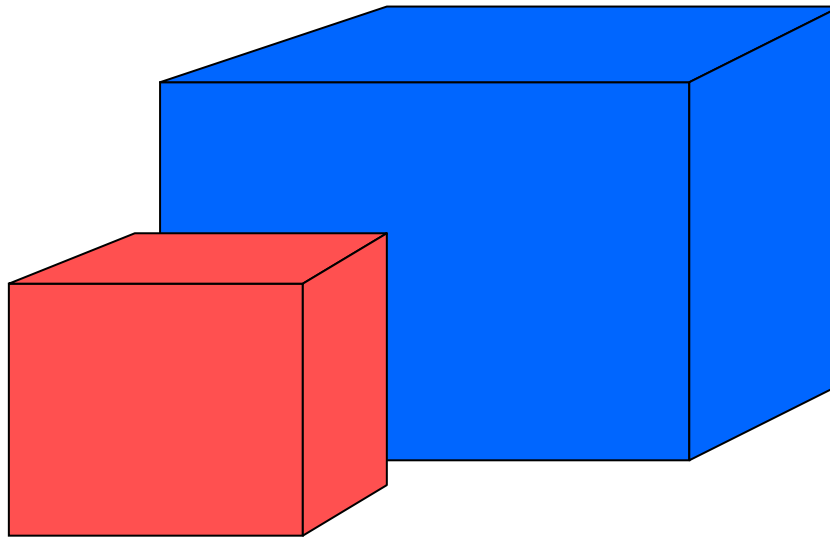
Rendern



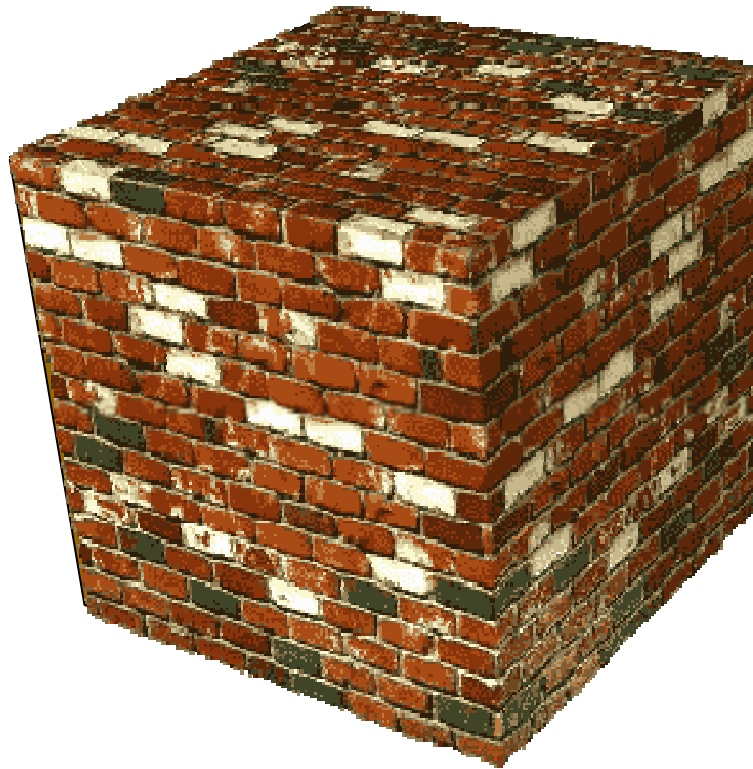
Beleuchtung



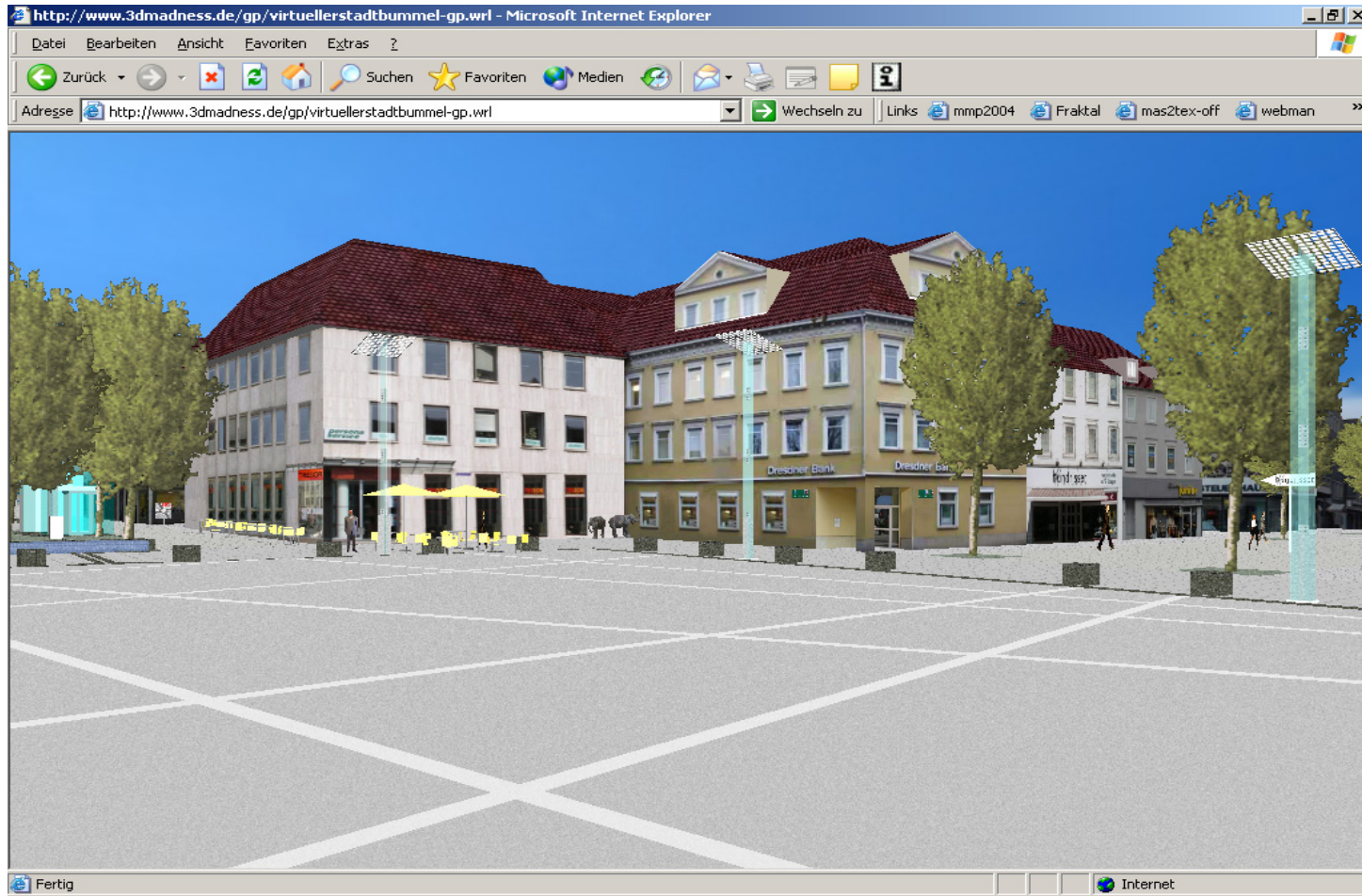
Culling



Texturing

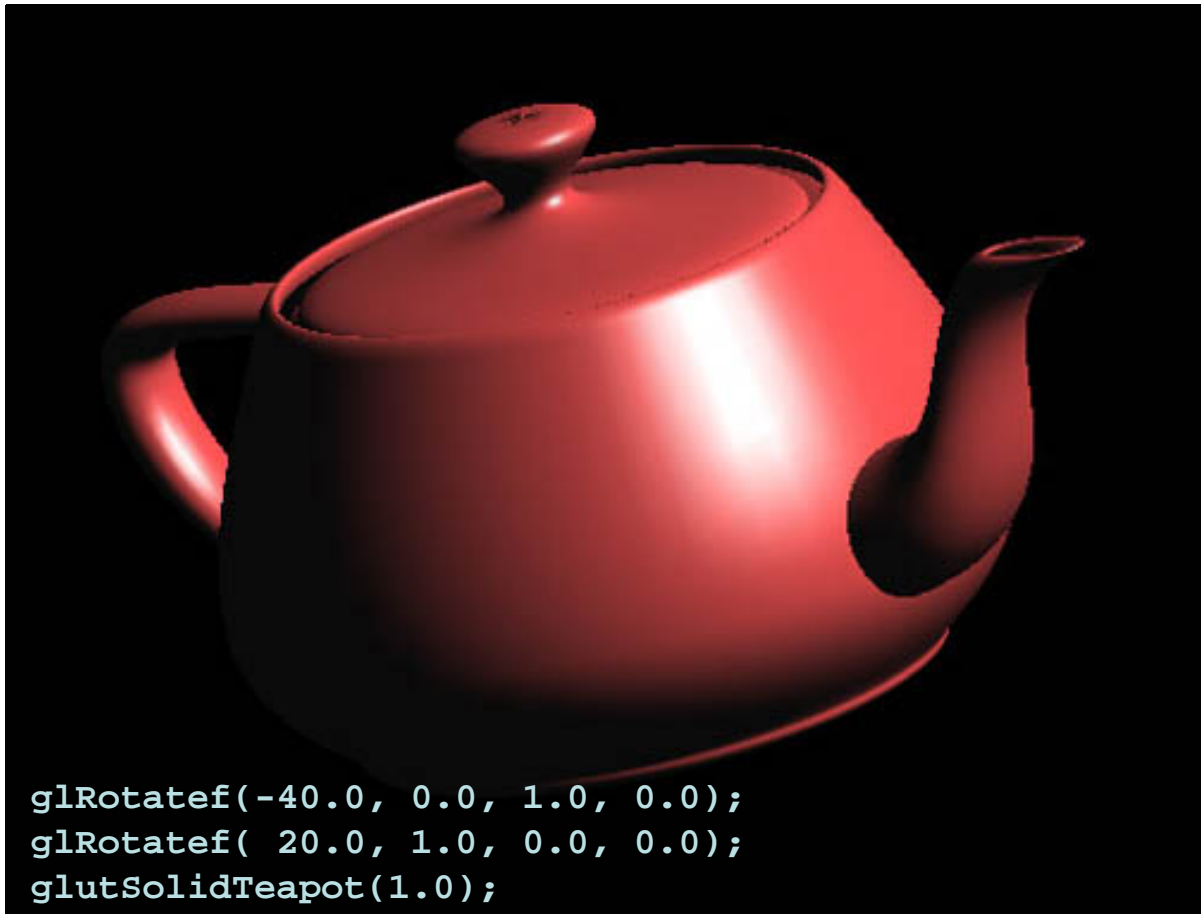


VRML

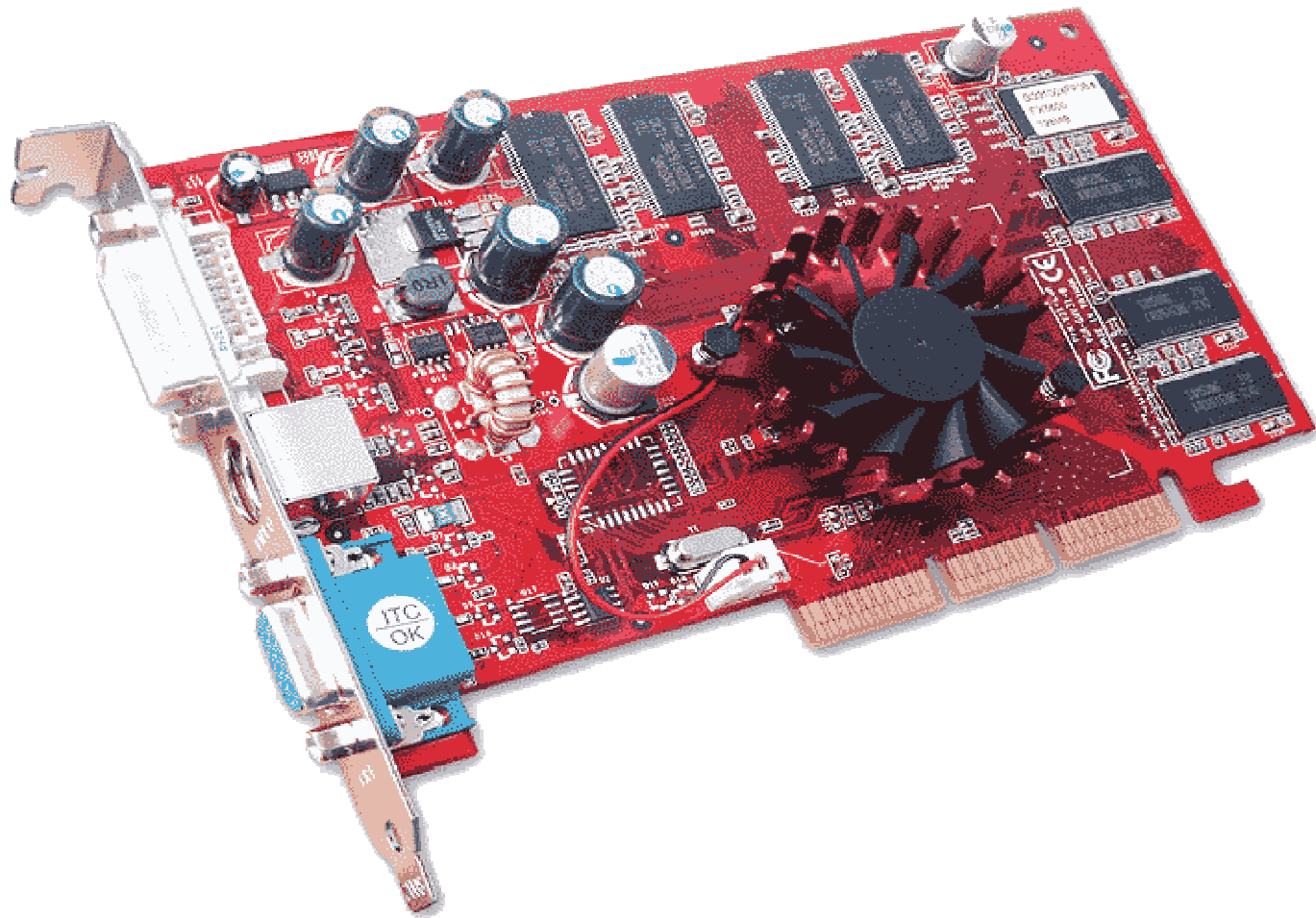


<http://www-lehre.inf.uos.de/gp/>

OpenGL



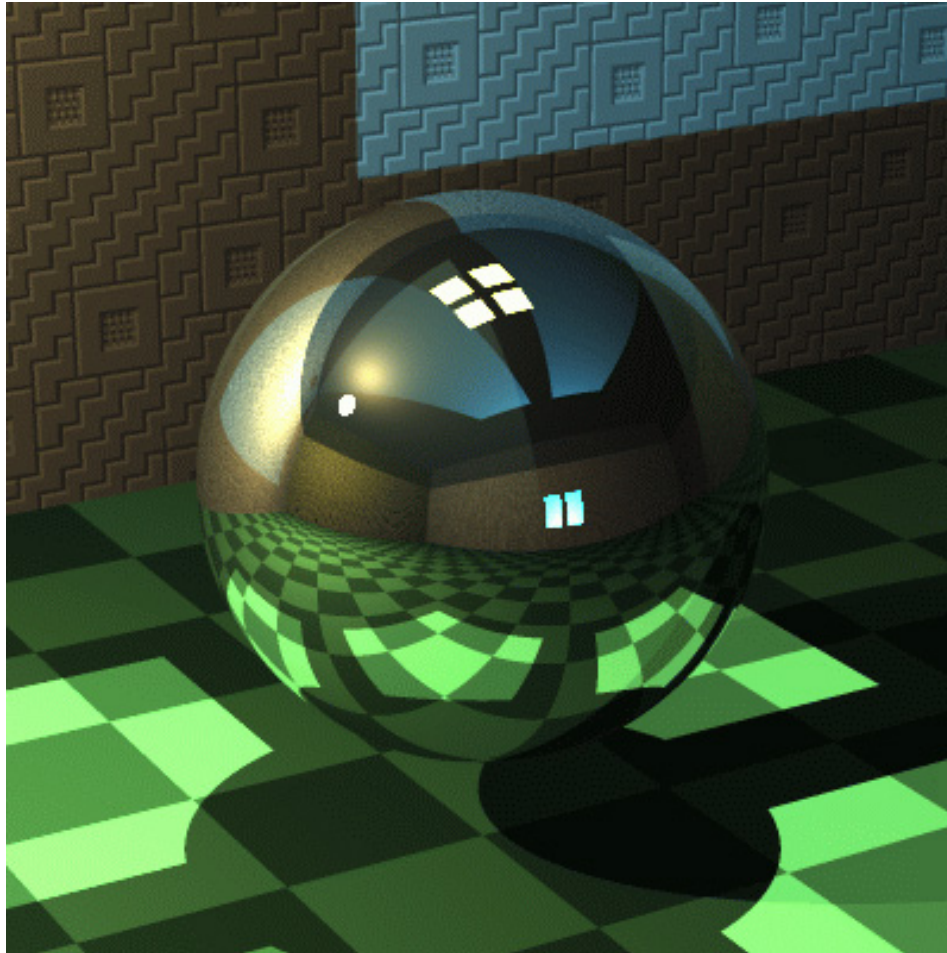
Hardwarebeschleunigung



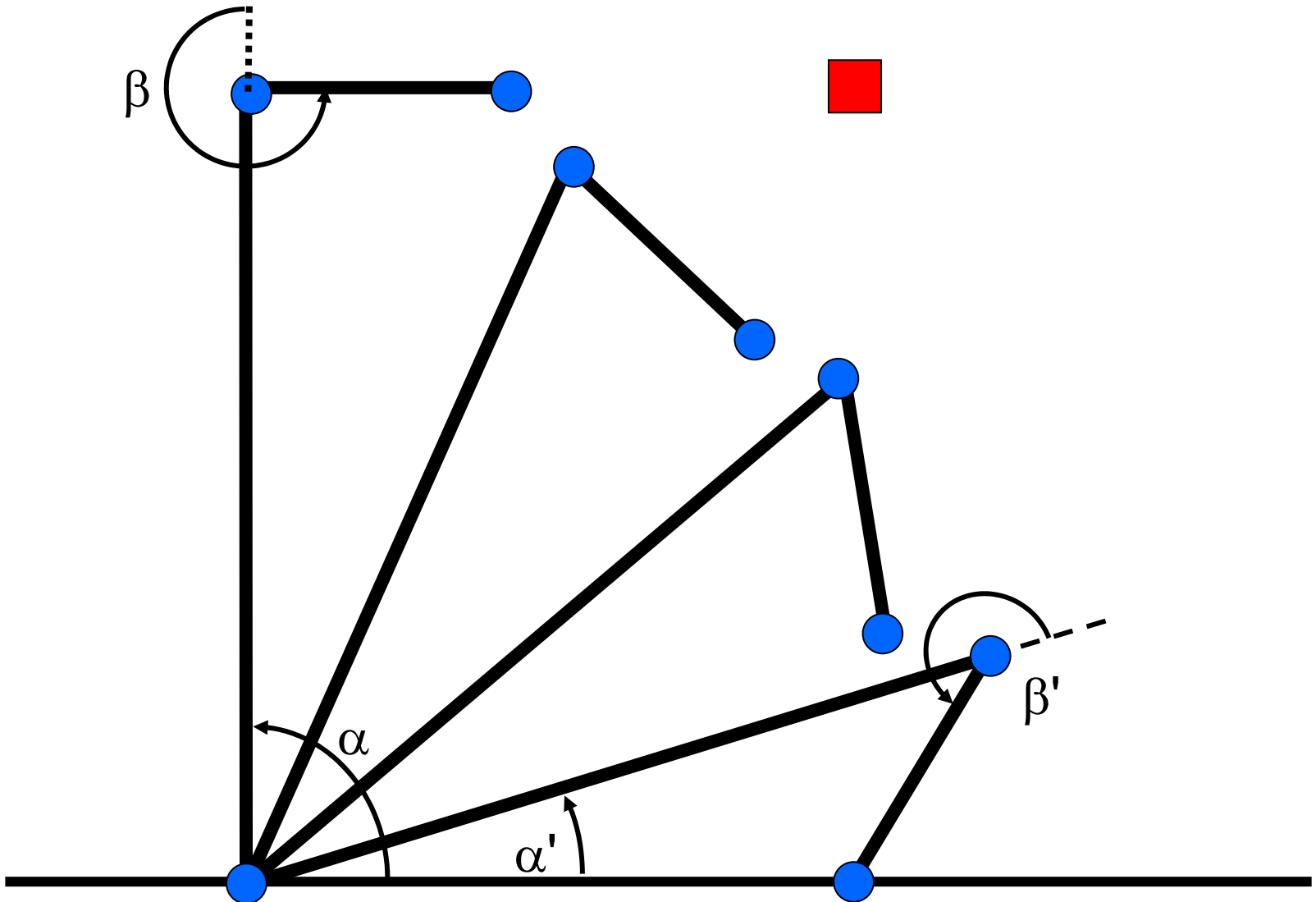
Radiosity



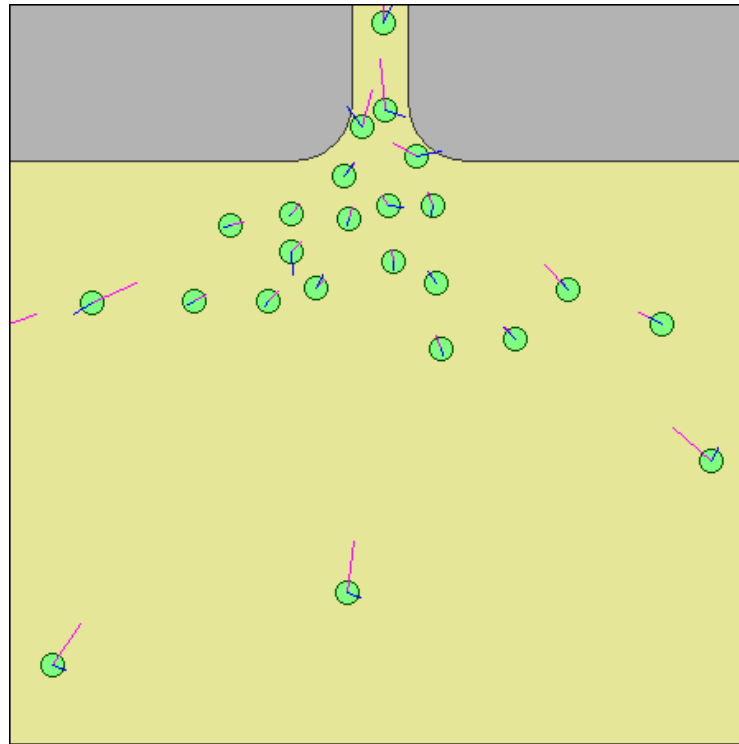
Ray Tracing



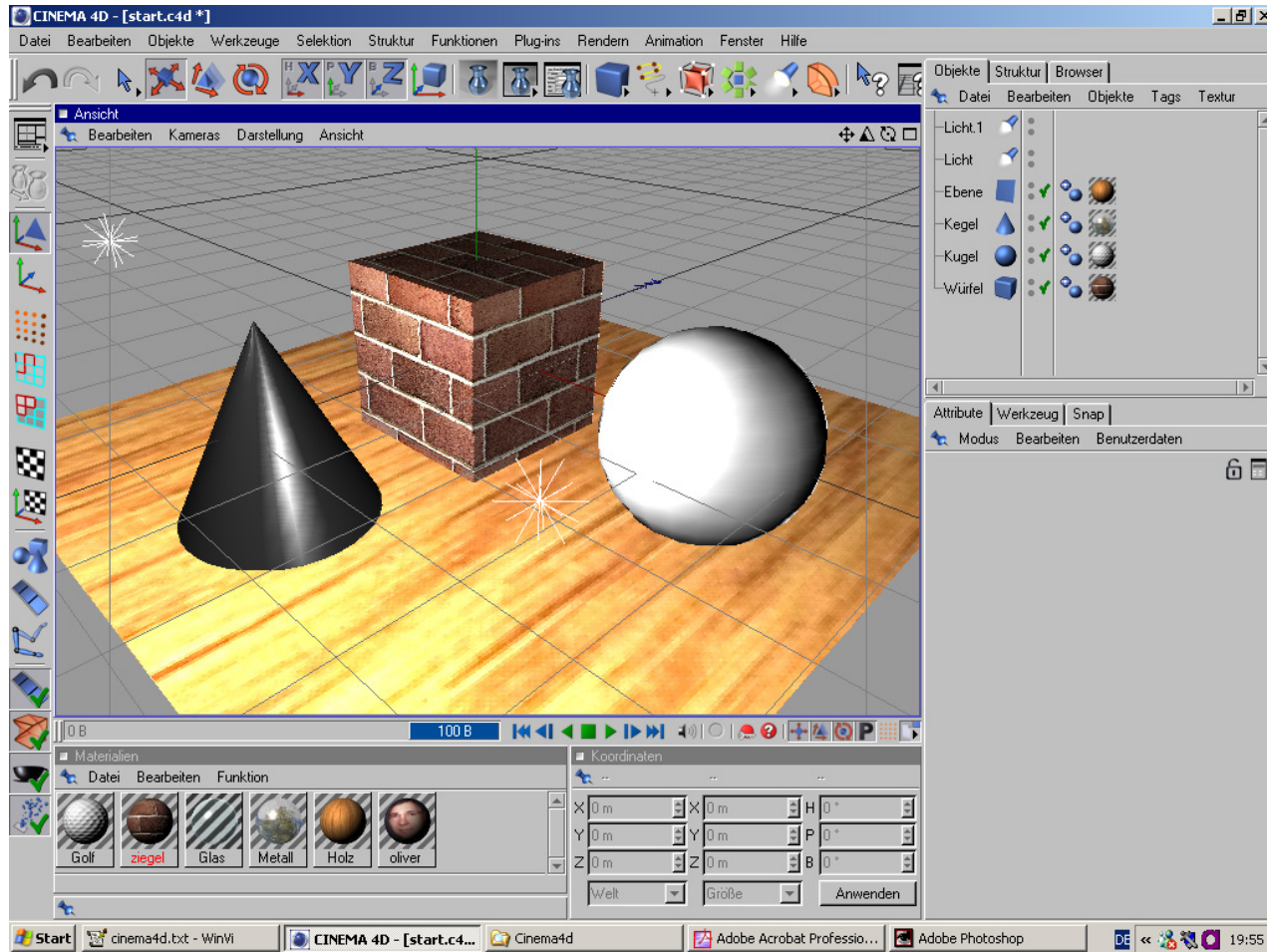
Inverse Kinematik



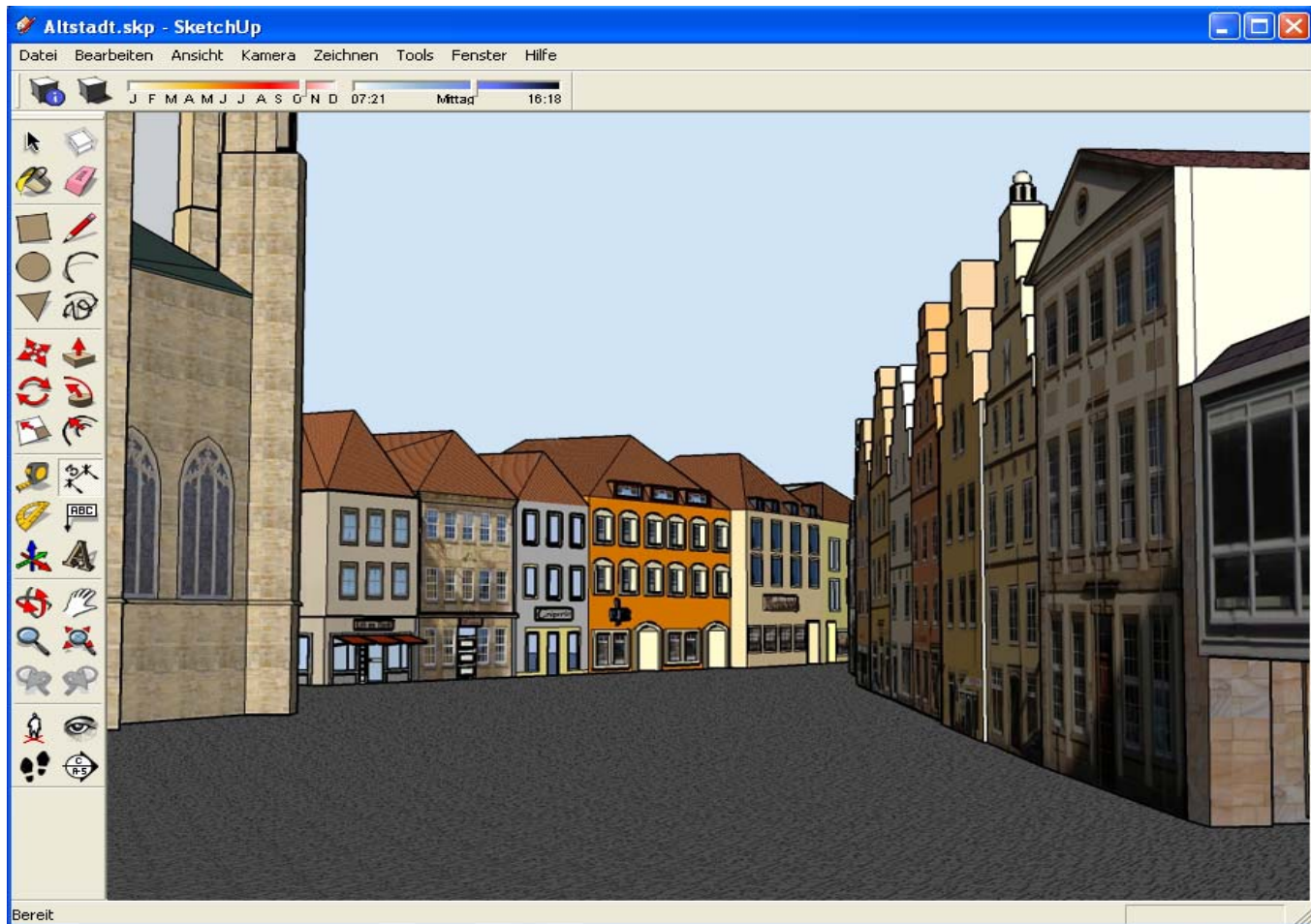
Partikelsysteme



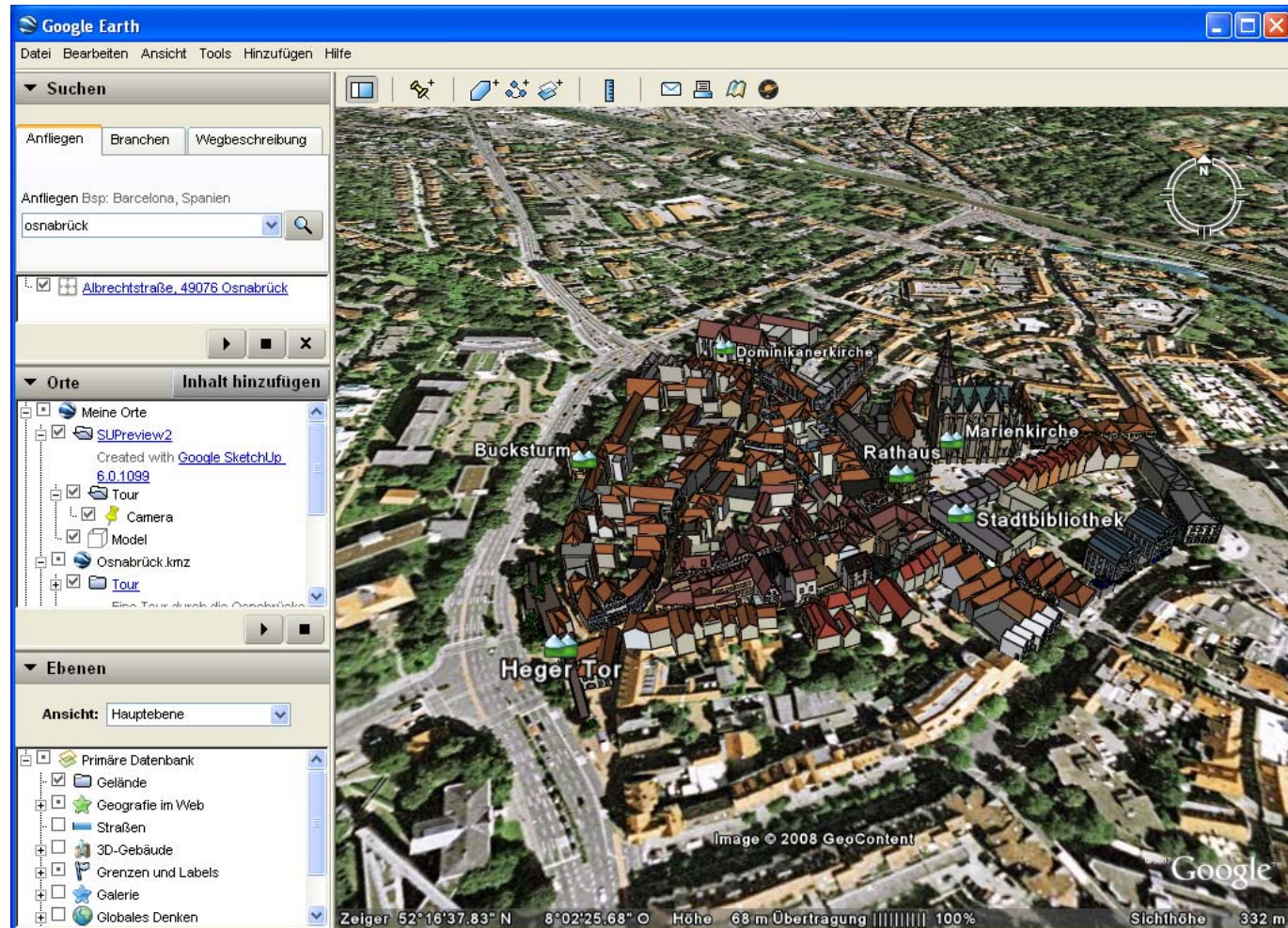
Maxon Cinema4D



Google SketchUp



Google Earth



Formblatt & Skript

- Formblatt ausfüllen
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1 Skript: 7.00 €

3 Skripte: 20.00 €