Die Tricks der Spieleentwickler

Prof. Dr. Daniel Scherzer
Hochschule Ravensburg-Weingarten

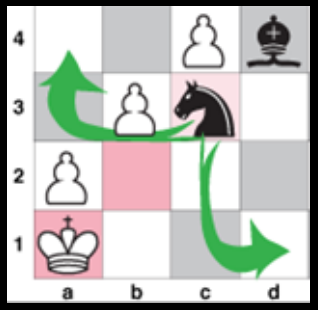

RYSE
SON OF ROME

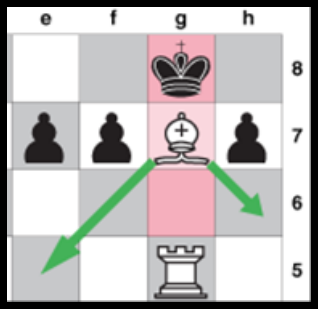

Tri-Drop Shot
俺屍
ORESHIKA
TAINTED BLOODLINES™
10/1120
Show Results

Gemeinsame Prinzipien?

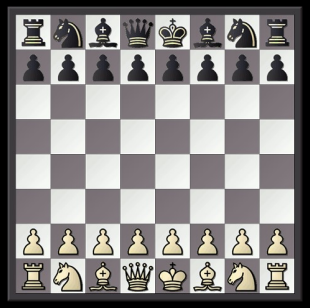
Reales Spiel – Schach

Spieler





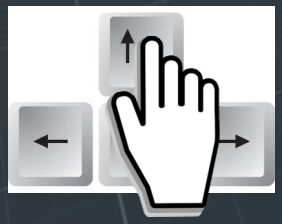
Regeln



Representation

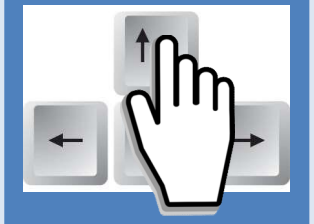
Spieler ≈ Interaktion

- Auswirkung auf Spielwelt
- Zeitpunkt unbekannt ≠ Film



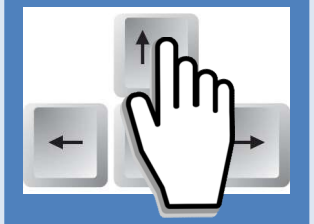
Spieler ≈ Interaktion

Benutzer Eingaben



Spielregeln?

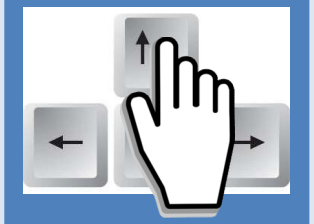
Benutzer Eingaben



Spiele Mechanik

Spiele Mechanik = Spielregeln + Spielstatus

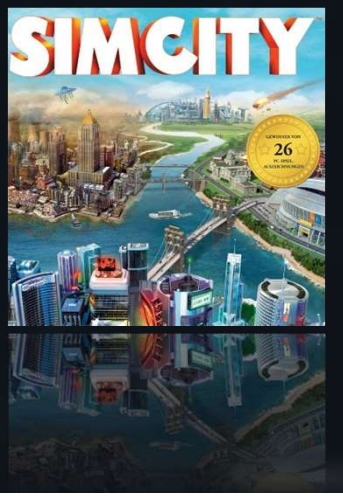
Benutzer Eingaben



Spiele Mechanik

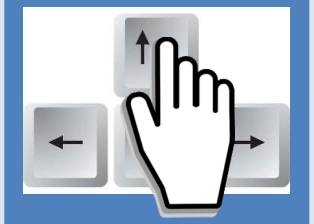
- Poker, Schach, Monopoly

- Simulationen



Representation?

Benutzer Eingaben



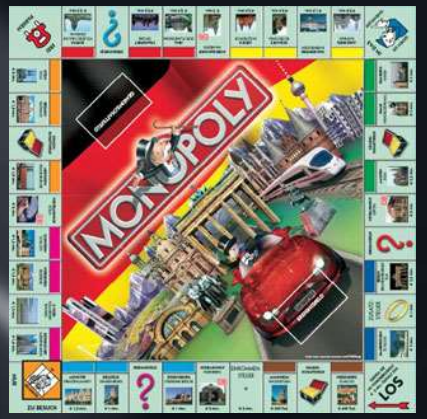
Spiele Mechanik

Spielwelt darstellen

Am Computer anders!

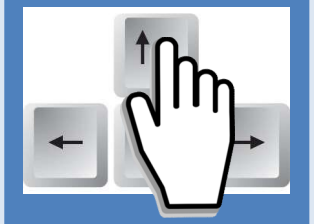
- Folge von Bildern am Display

- Realität



Spiele Mechanik vs. Spielwelt darstellen

Benutzer Eingaben



Spiele Mechanik

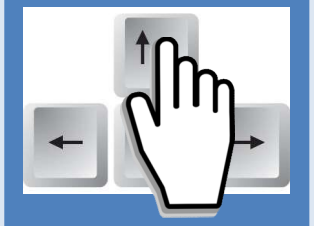
?

Spielwelt darstellen

Spiele Mechanik vs. Spielwelt darstellen

- Physik des Fahrzeugs

Benutzer Eingaben



Spiele Mechanik

Spielwelt darstellen

60 mal pro Sekunde

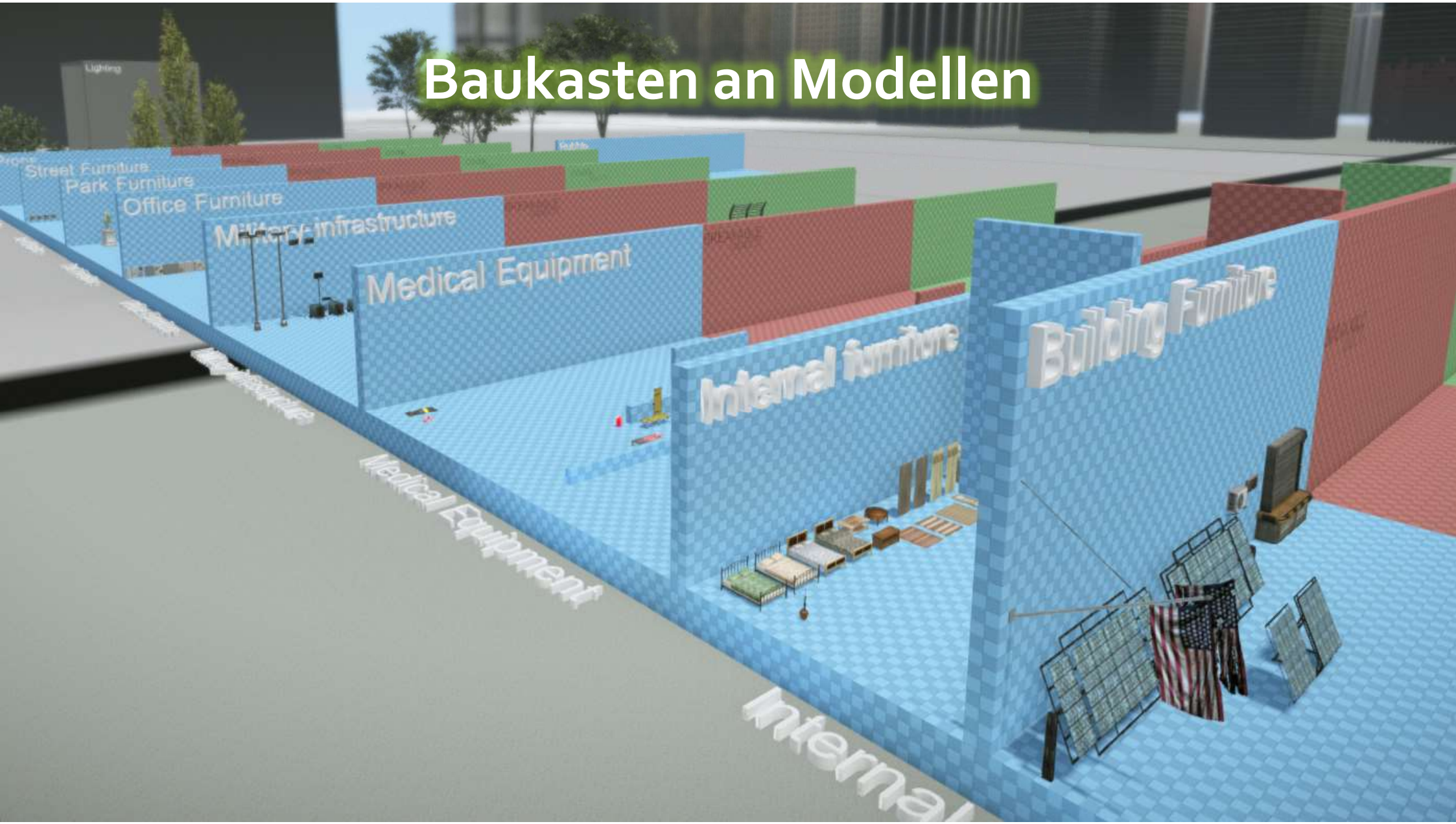
Spielwelten realisieren?

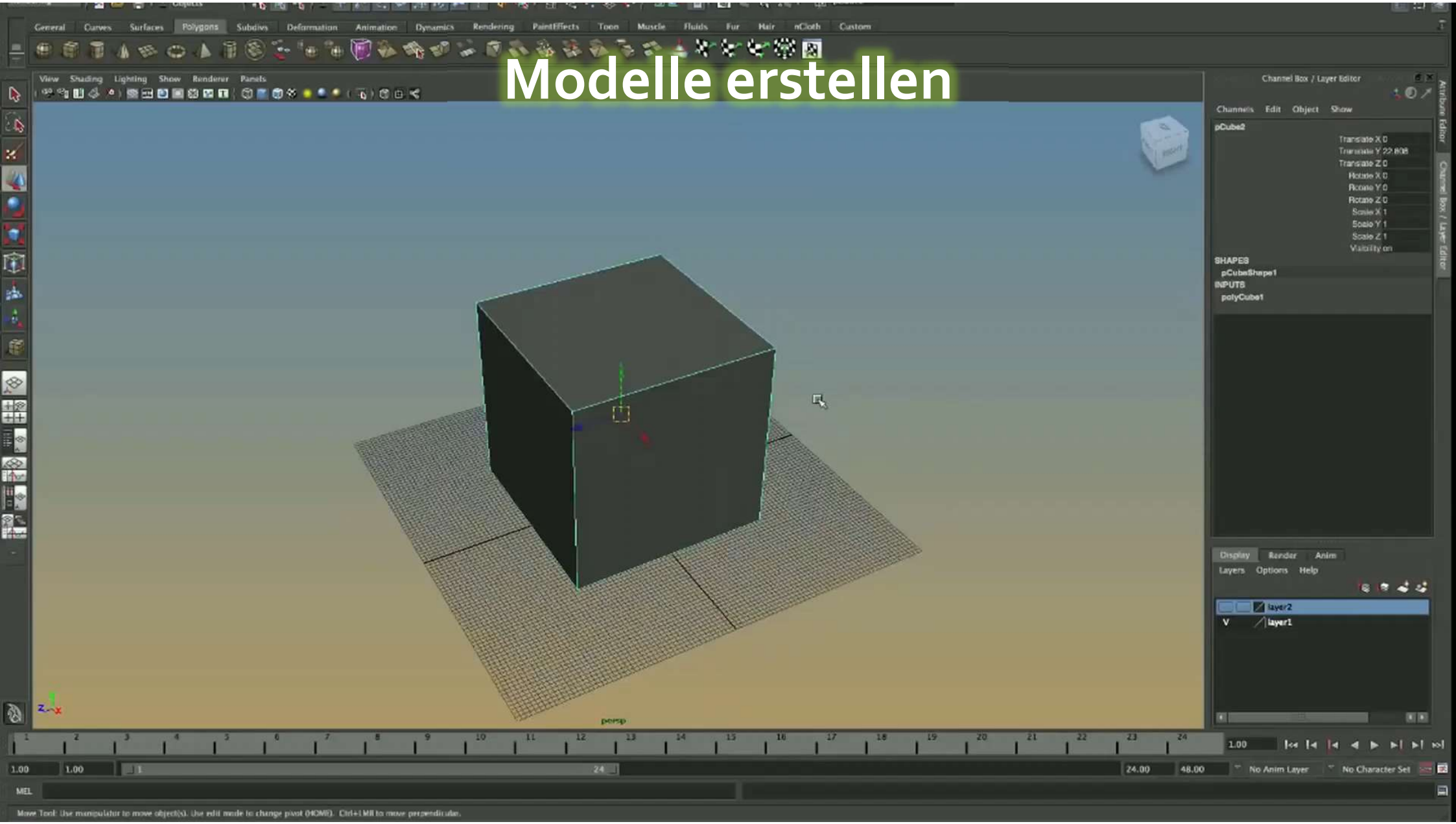
Spielwelten realisieren?


Spielwelten realisieren?


Baukastenprinzip
Untitled
KiteDemo
File
Edit
Window
Help
Search For Help
Modes
Save
Source Control
Content
Marketplace
Settings
Search Classes
Recently Placed
Basic
Lights
Visual Effects
BSP
Volumes
All Classes
Empty Actor
Empty Charac
Point Light
Player Start
Cube
Sphere
Cylinder
Cone
Box Trigger
Sphere Trigg
Perspective
Lit
Show
World Outliner
Search...
Label
Type
Untitled
World
Atmospheric Fog
Light Source
Player Start
PlayerStart
Sky Sphere
Edit BP_Sky_
4 actors
View Options
Details
World Settings
Select an object to view details.
Level: Untitled (Persistent)


Baukasten an Modellen
Lighting
Vegetation


Baukasten an Modellen
Lighting
Street Furniture
Park Furniture
Office Furniture
Medical Equipment
Internal furniture
Building Furniture
Medical Equipment
Internal

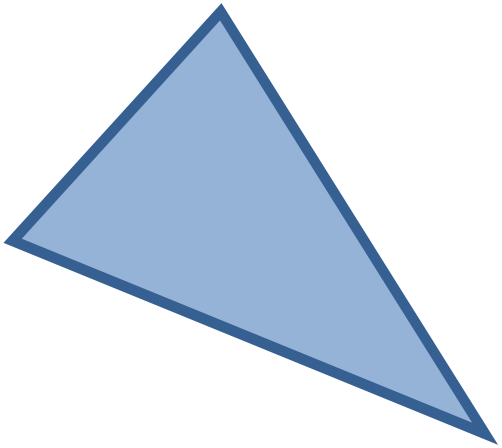

Modelle erstellen
General
Curves
Surfaces
Polygons
Subdivs
Deformation
Animation
Dynamics
Rendering
PaintEffects
Toon
Muscle
Fluids
Fur
Hair
nCloth
Custom
View
Shading
Lighting
Show
Renderer
Panels
Channel Box / Layer Editor
Channels
Edit
Object
Show
pCube2
Translate X 0
Translate Y 22.808
Translate Z 0
Rotate X 0
Rotate Y 0
Rotate Z 0
Scale X 1
Scale Y 1
Scale Z 1
Visibility on
SHAPES
pCubeShape1
INPUTS
polyCube1
Display
Render
Anim
Layers
Options
Help
layer2
layer1
persp
1.00
24.00
48.00
No Anim Layer
No Character Set
MEL


Modelle bestehen aus Primitiven

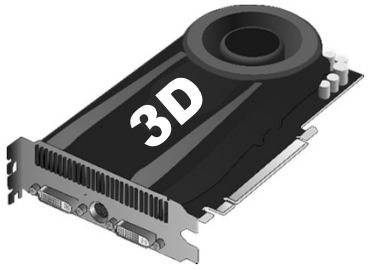
Szenen bestehen aus Primitiven


Szenen bestehen aus Primitiven

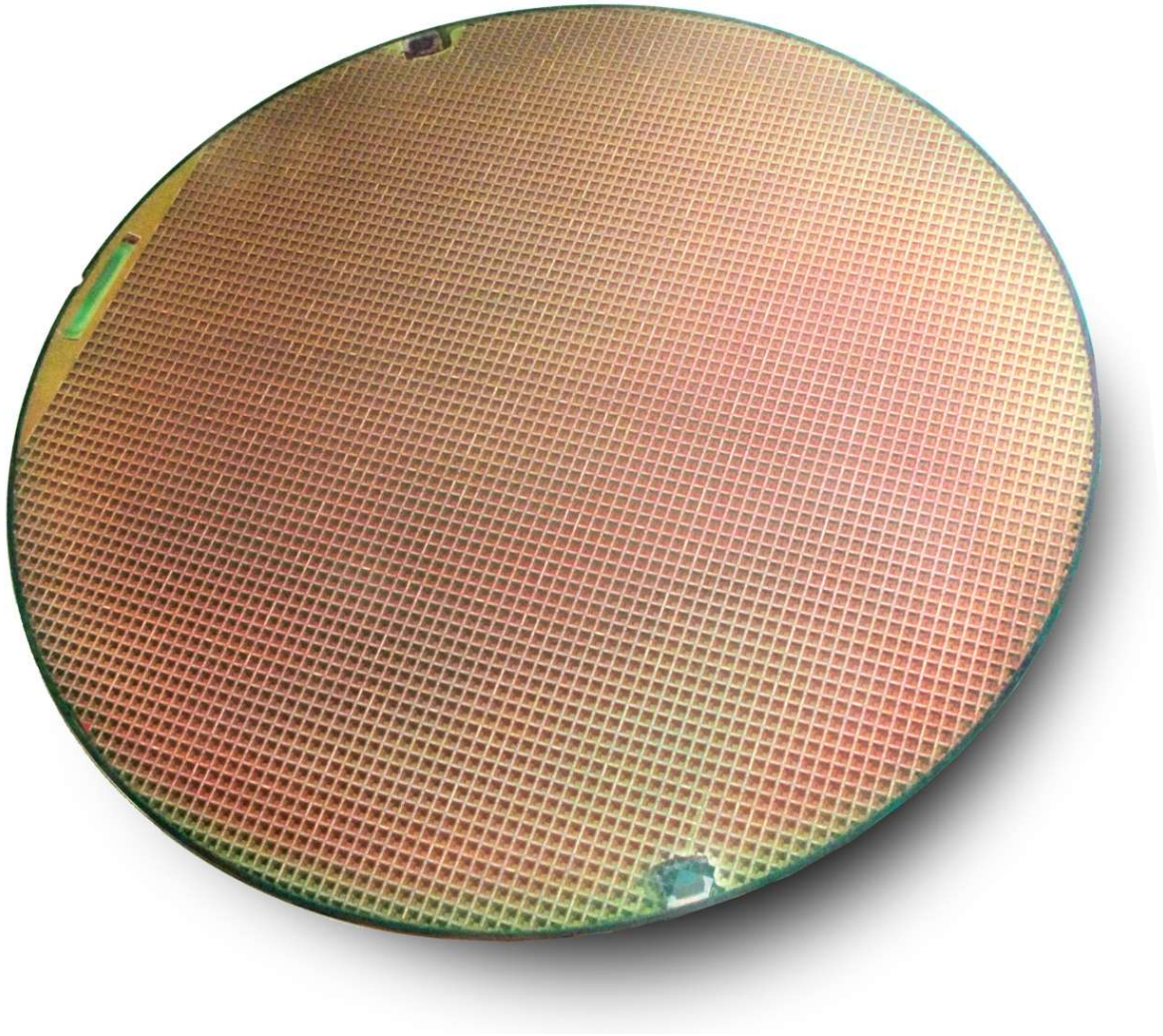
Wieso Dreiecke?



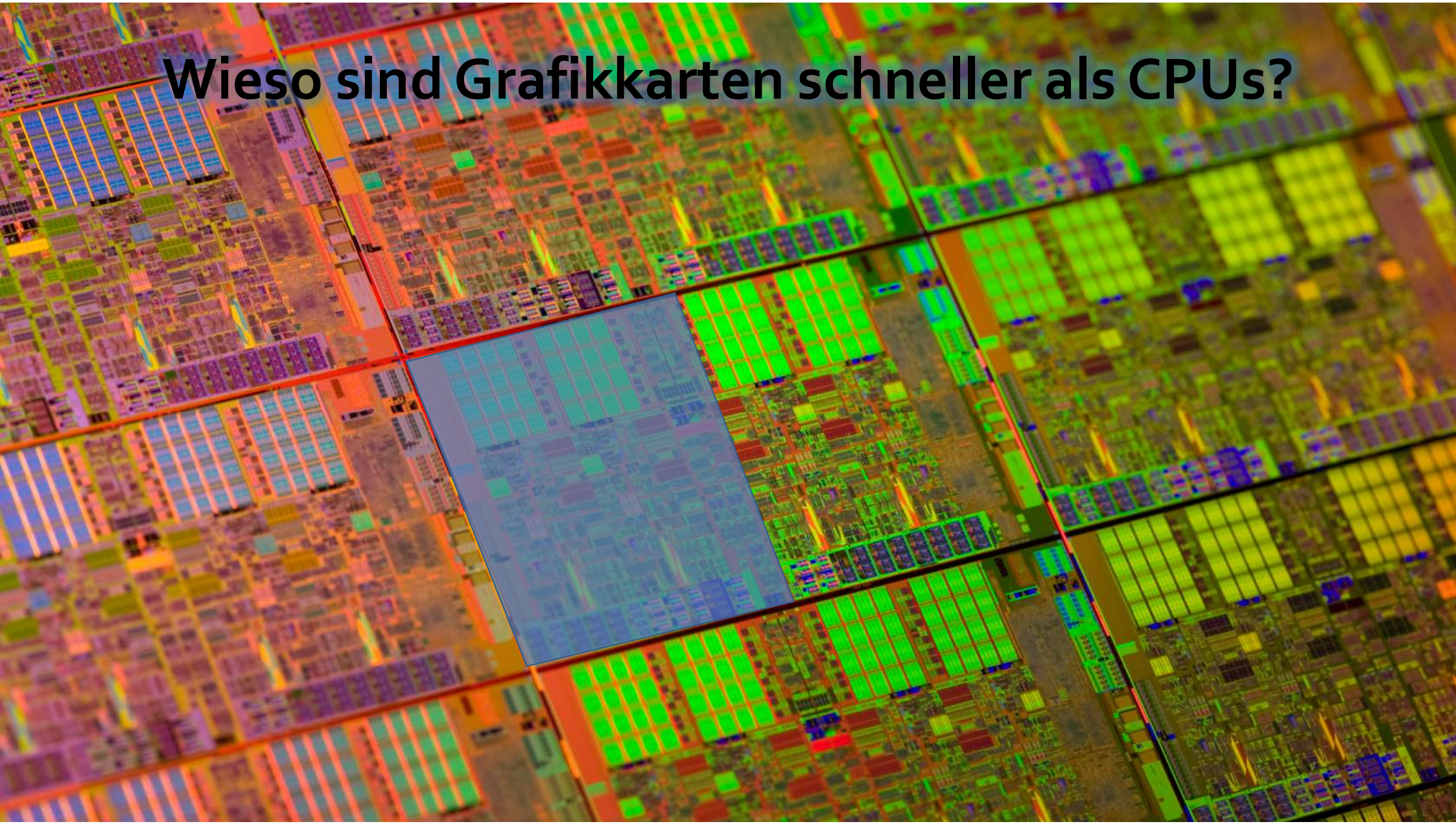
- Alles mit Dreiecken darstellbar
- Mathematische Eigenschaften
- Effiziente Hardware für Verarbeitung
  - Grafikkarten (~5 Mrd. Dreiecke/Sekunde)



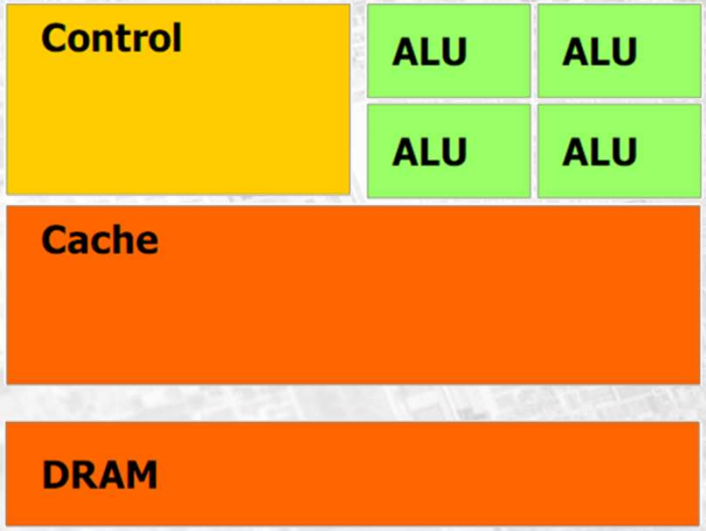
Wieso sind Grafikkarten schneller als CPUs?



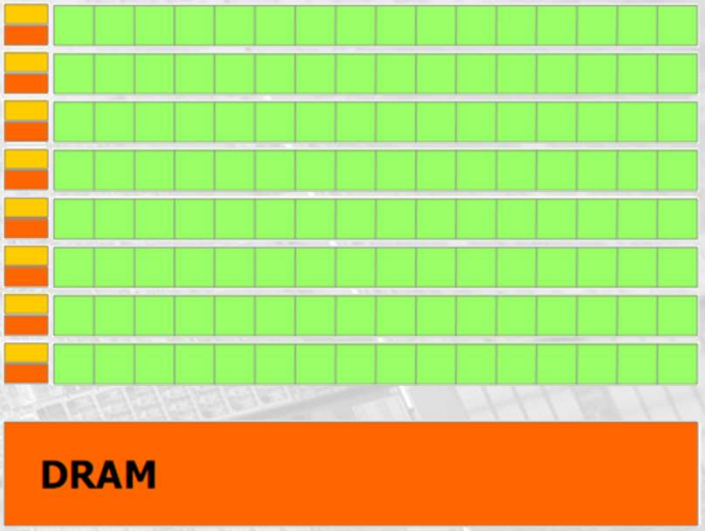
Wieso sind Grafikkarten schneller als CPUs?



Wieso sind Grafikkarten schneller als CPUs?



CPU

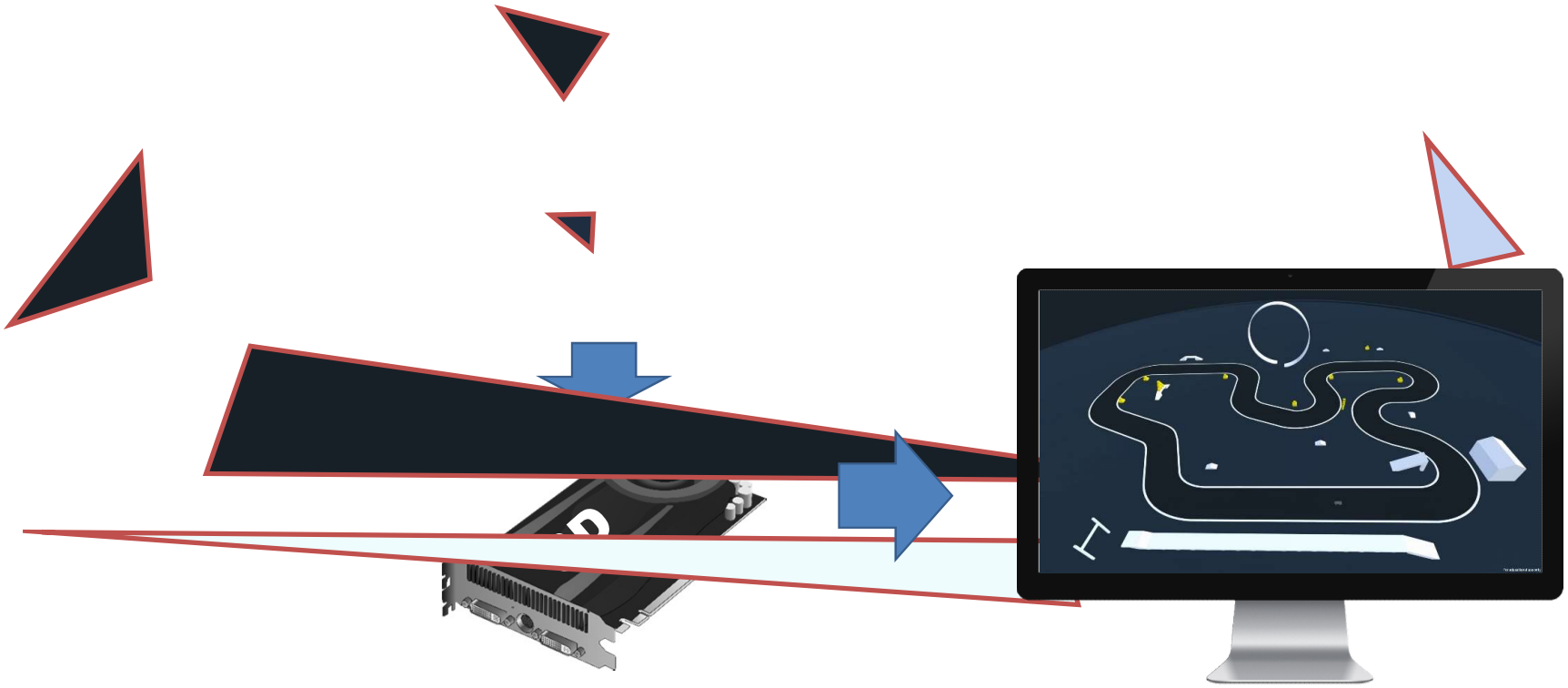


GPU

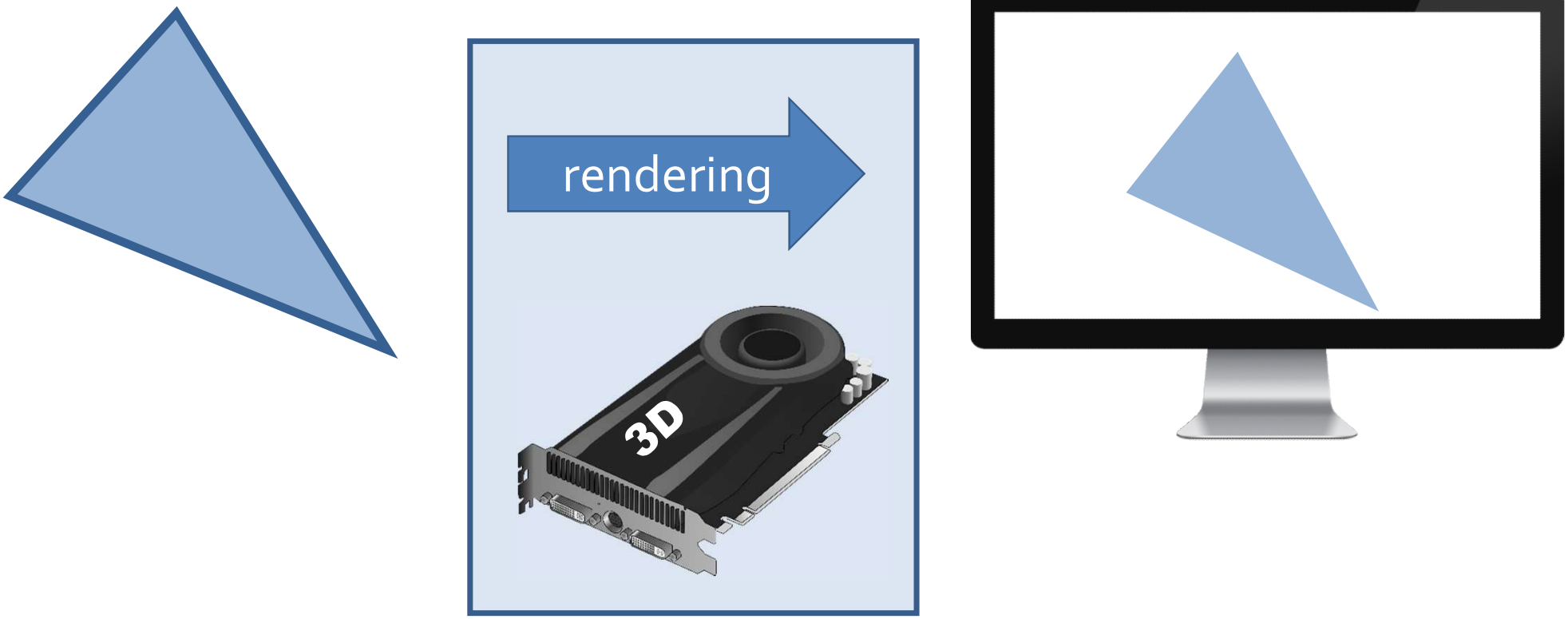
Szene zeichnen = zeichne Liste von Dreiecken

Szene zeichnen = zeichne Liste von Dreiecken

Grafikkarte erzeugt aus Dreiecken Bilder

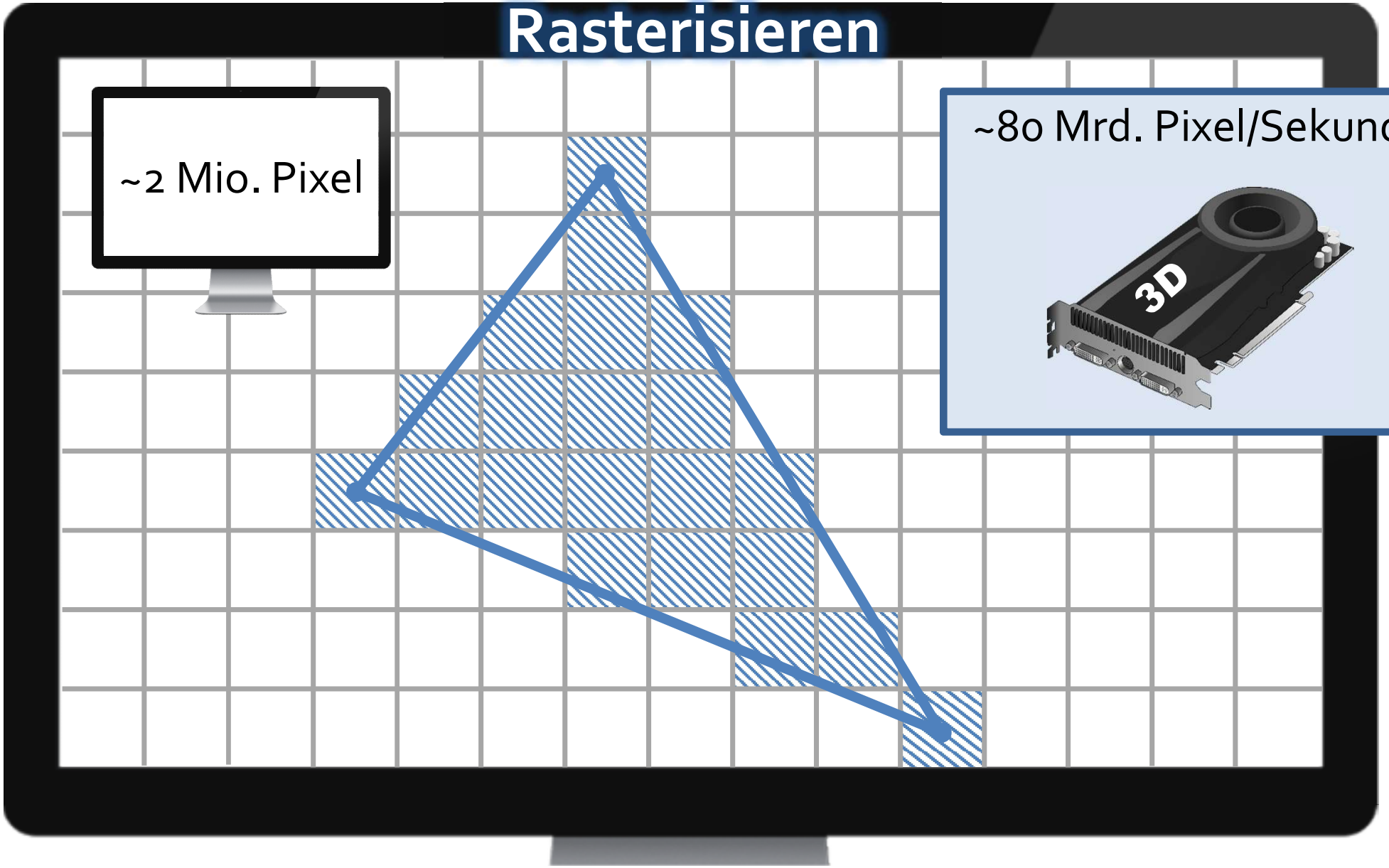


Rendering = Von der Representation zum Bild



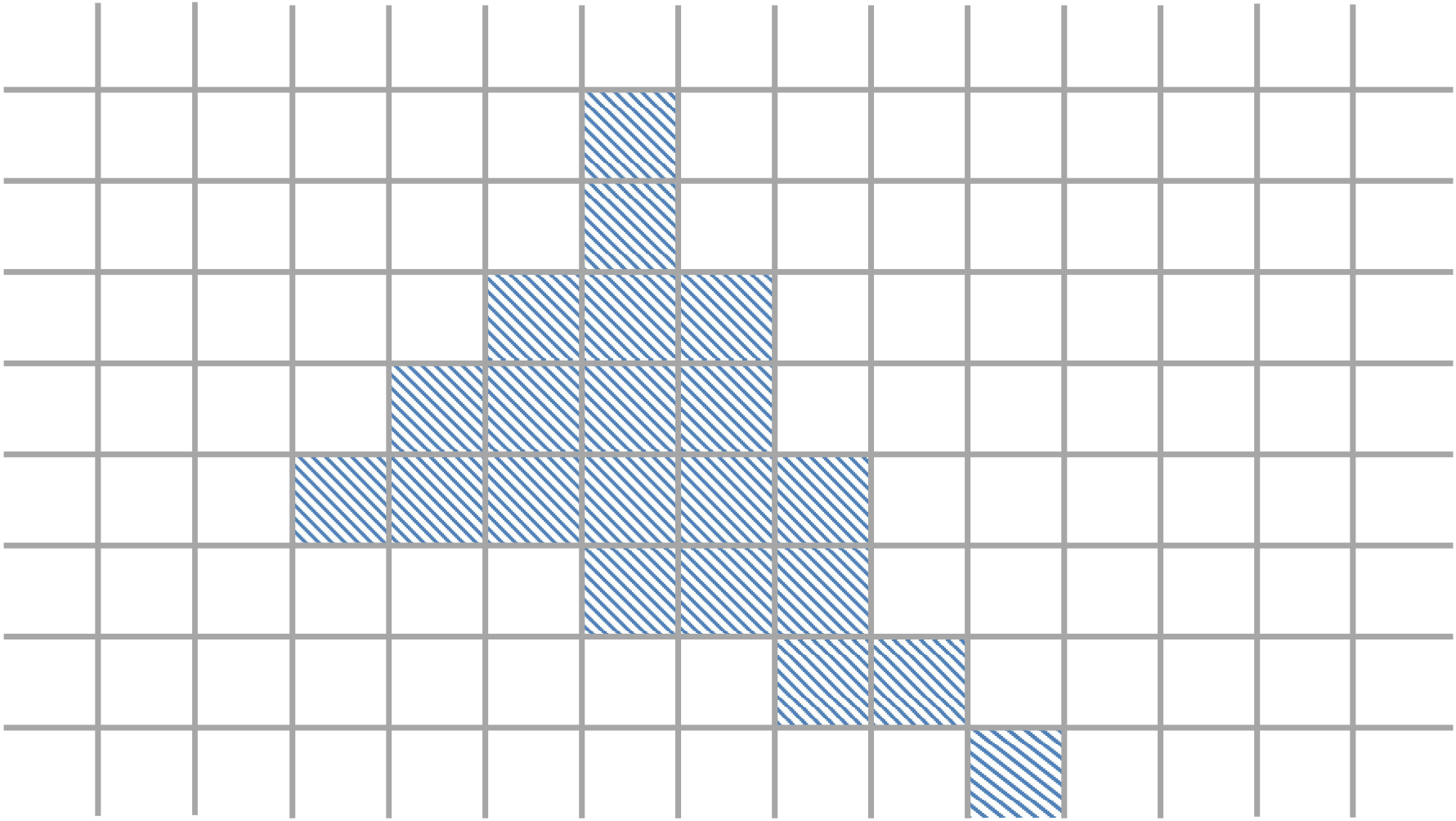
Rasterisieren

~2 Mio. Pixel

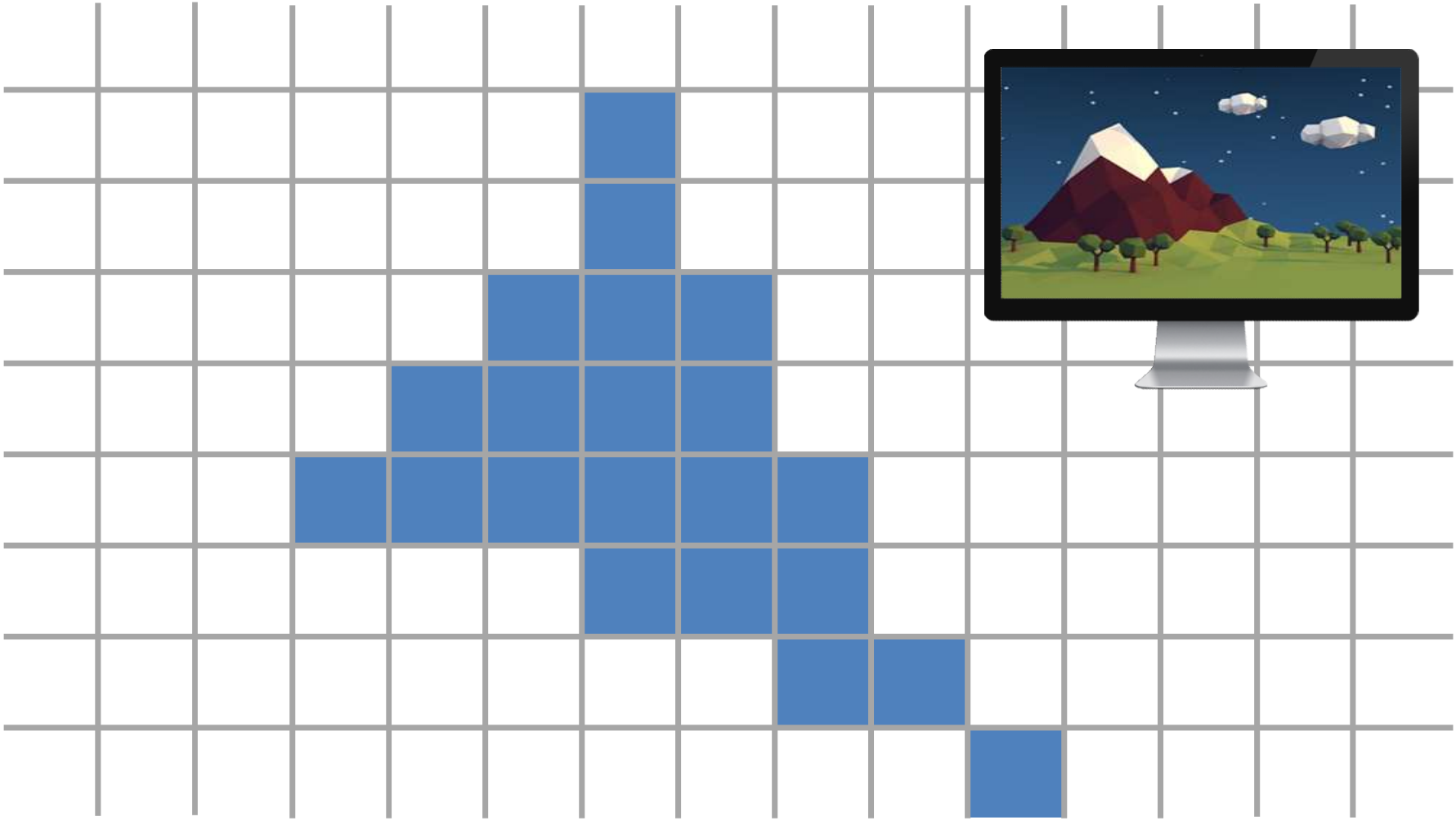


~80 Mrd. Pixel/Sekunde

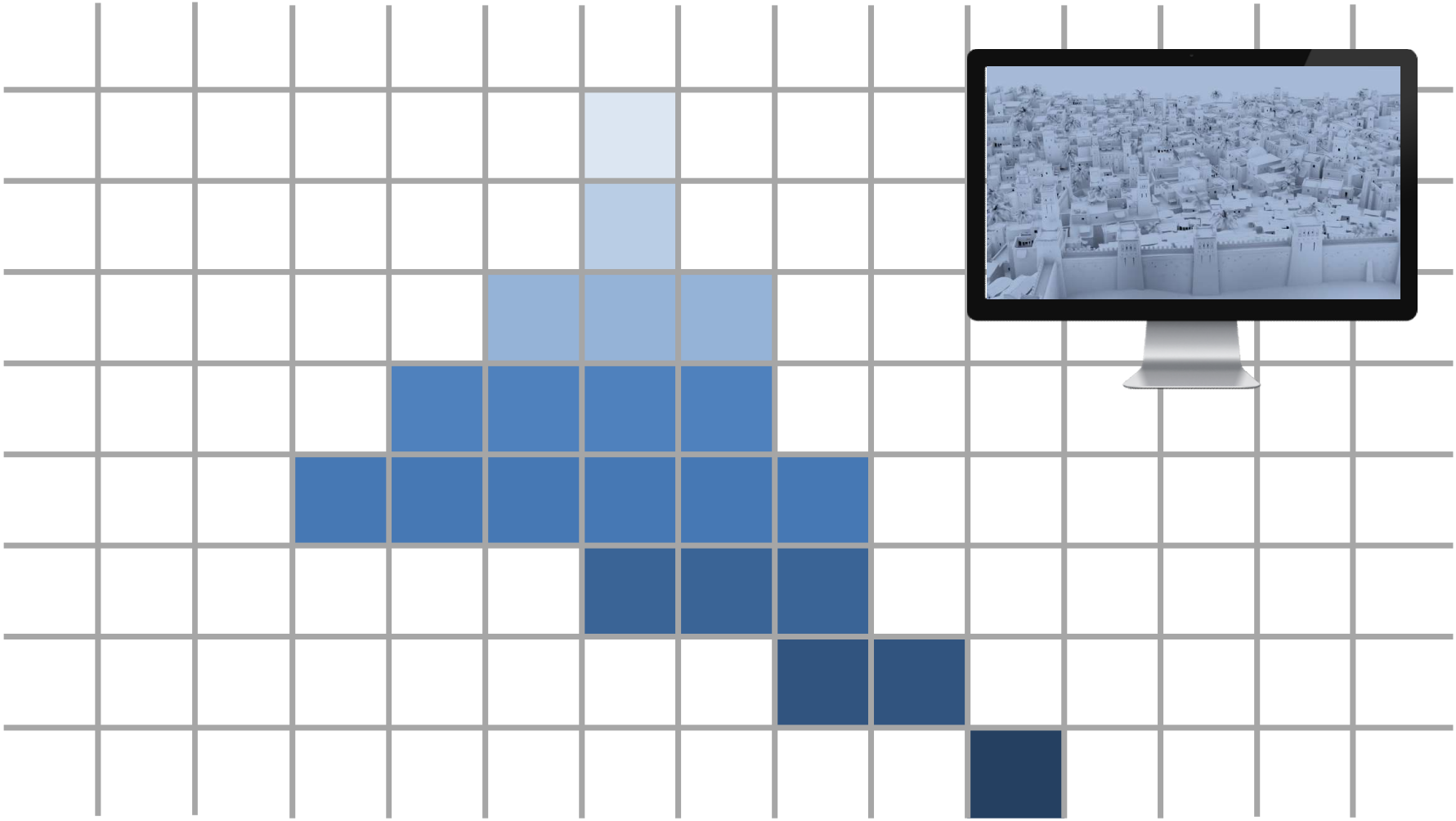
Farbe eines Pixels?



Farbe eines Pixels?



Farbe eines Pixels?



Farbe eines Pixels

- Große Freiheit gefordert
- Programmierbar
- Shader

Shader bestimmt Farbe eines Pixels

- Programme auf Grafikkarte

Vielen Dank für die Aufmerksamkeit!