Glas, Stahl und Geometrie

Mathematik in der modernen Architektur

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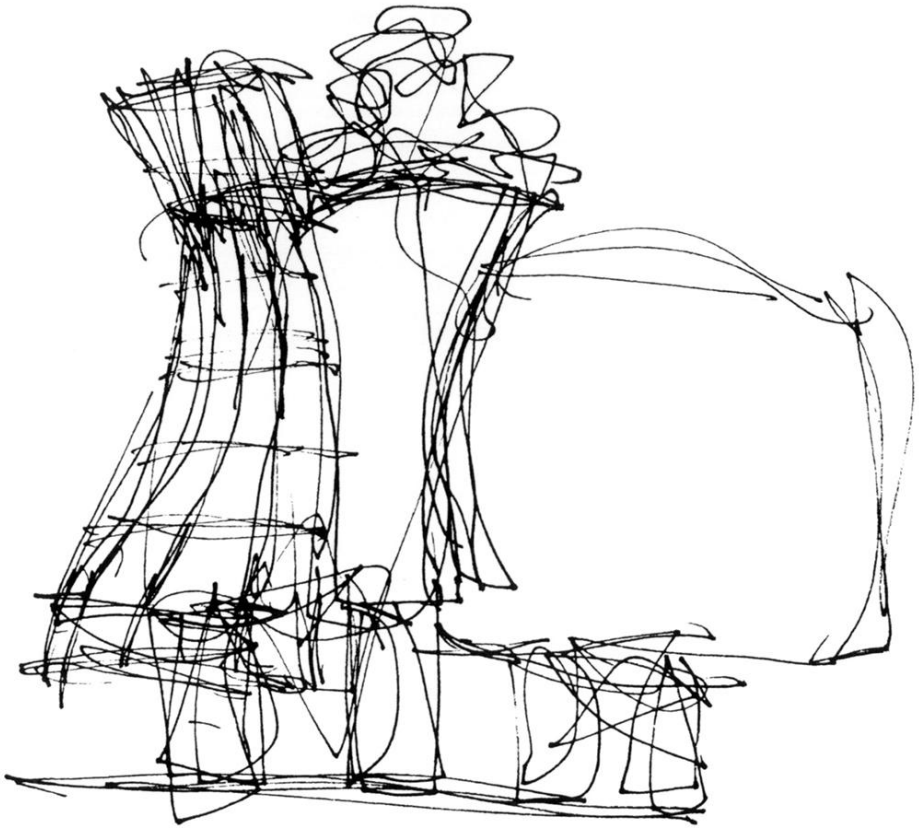


Tanzendes Haus, Frank Gehry, Prag 1996


KUNSTHAUS
GARAGE
FREI

U-Bahn Ausgang in Paris

U-Bahn Ausgang Saint Lazare Paris RFR Ingenieure

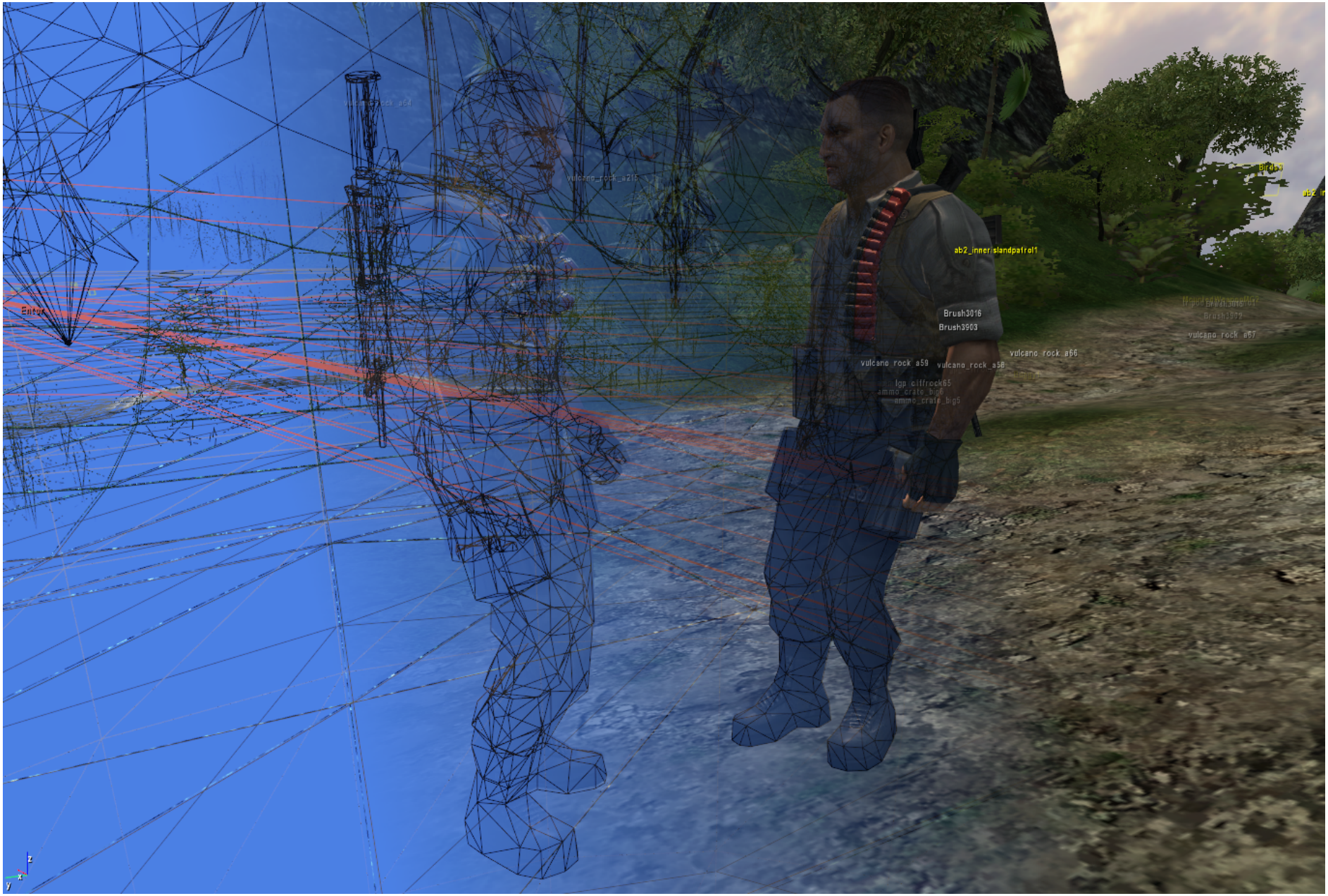
BMW Welt München

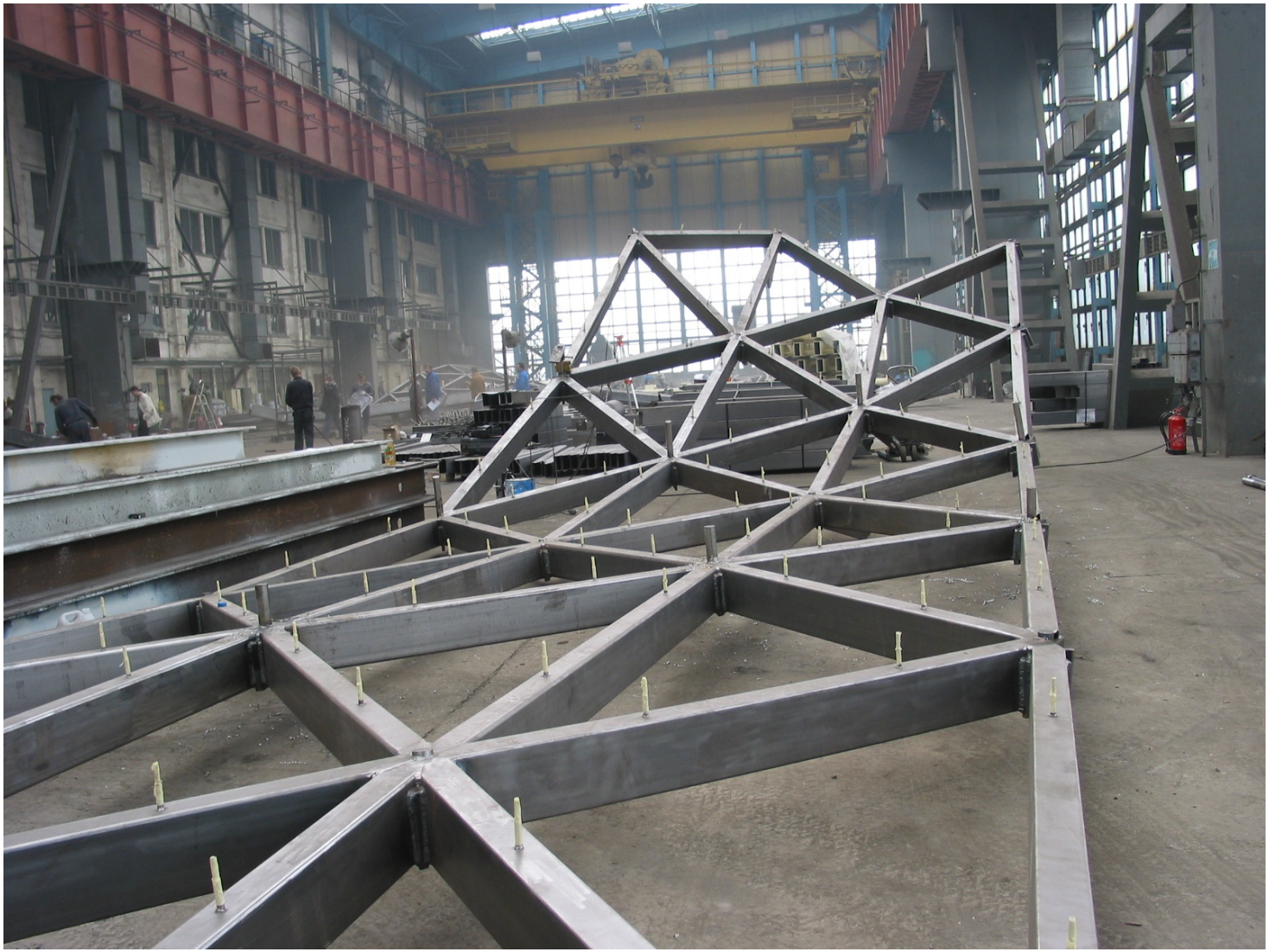
BMW Welt von Innen

MyZeil Frankfurt

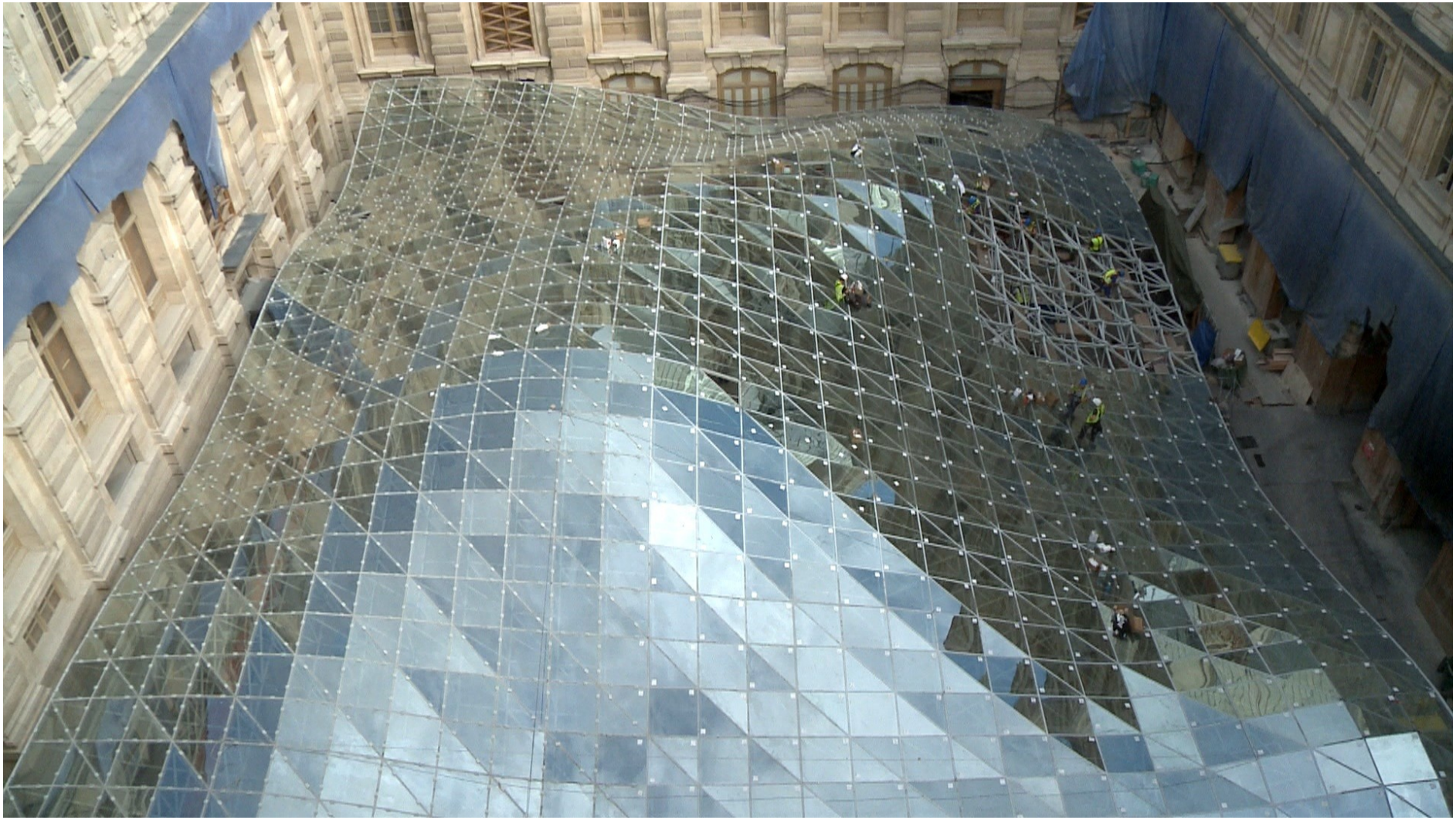
MyZeil 3D

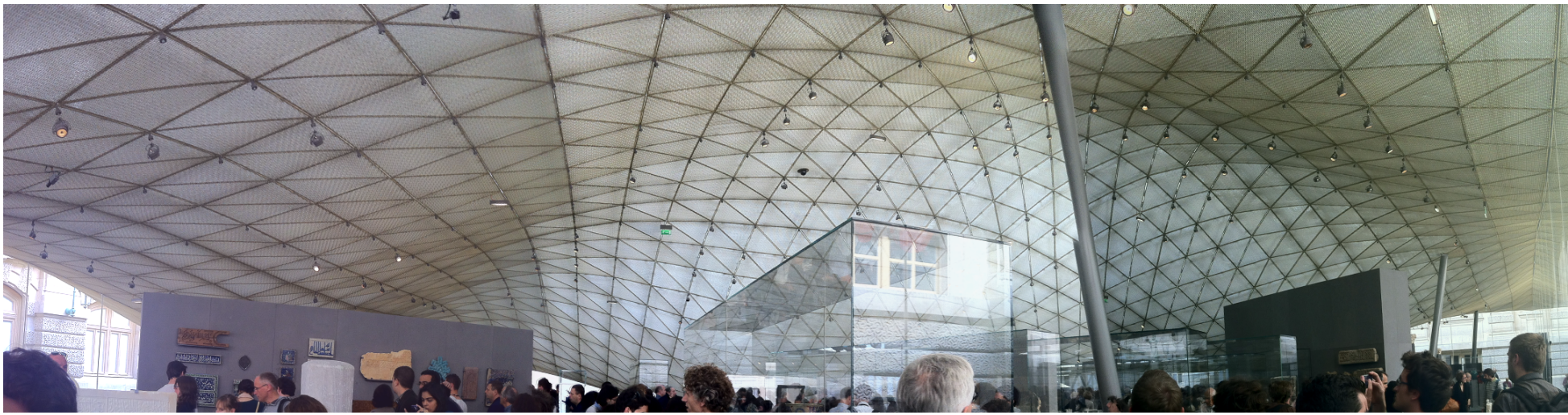
Dreiecksgitter in Computerspielen



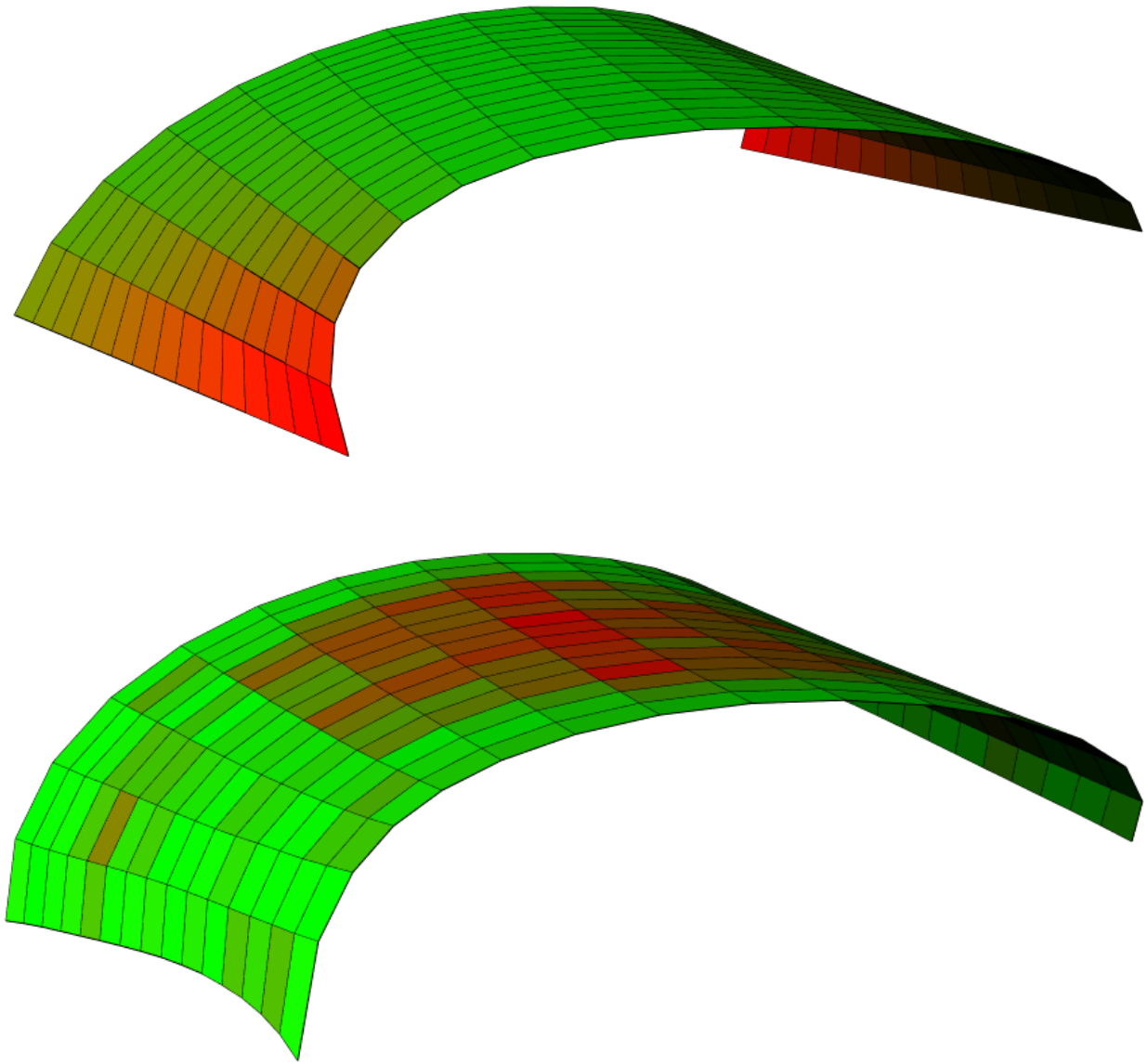



Berlin Hauptbahnhof
Lehrter Bahnhof

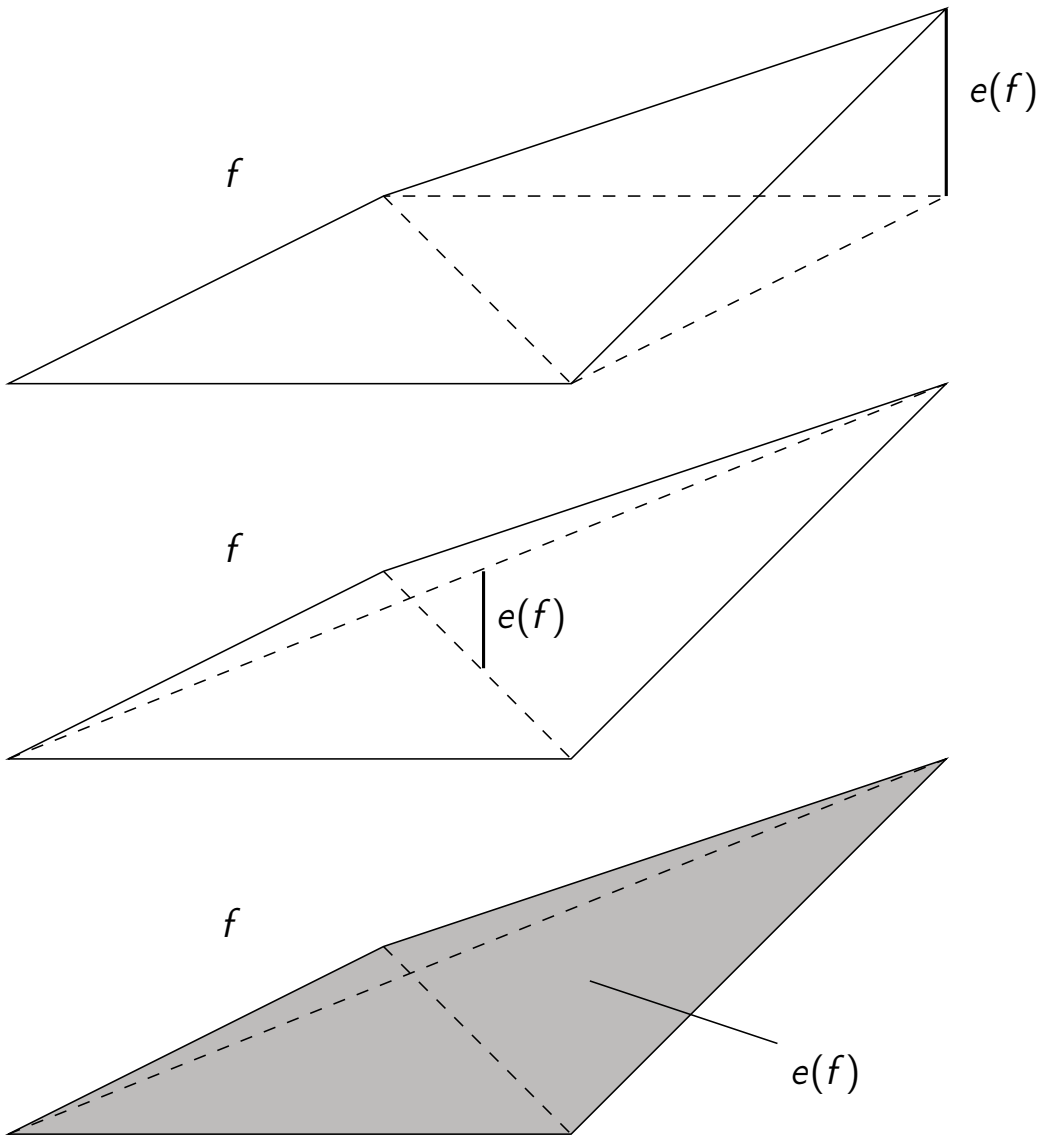




Louvre



Verschiedene Definitionen von Ebenheit



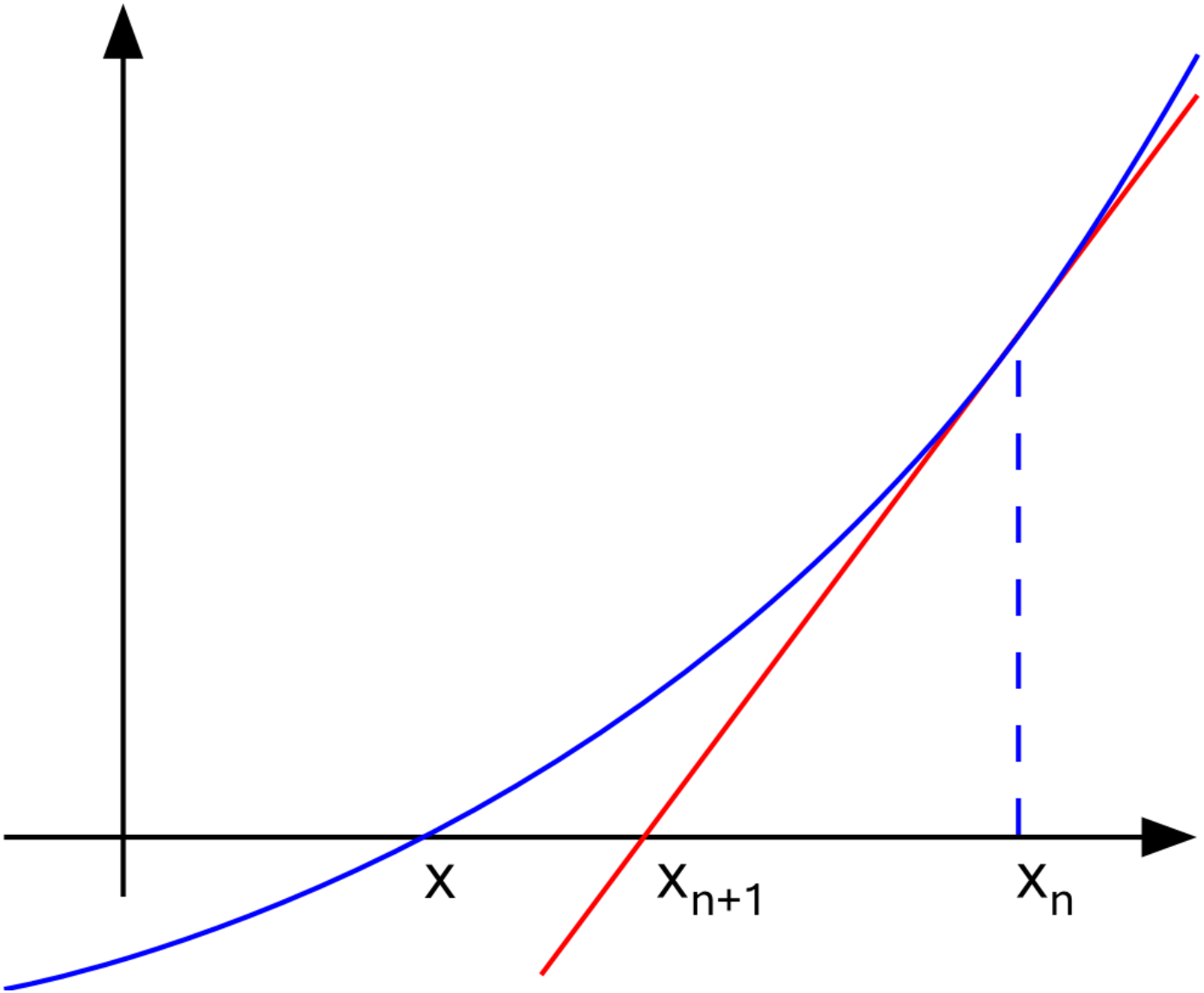
$$
\begin{aligned}
E(M) &= \sum_{f_i \in M} e(f_i) \\
&= e(f_1) + e(f_2) + \cdots + e(f_n)
\end{aligned}
$$

M - alle Glasscheiben
f_i - i-te Glasscheibe
$e(f_i)$ - Energie/Unebenheit der i-ten Glasscheibe
$E(M)$ - Energie/Unebenheit der gesamten Oberfläche

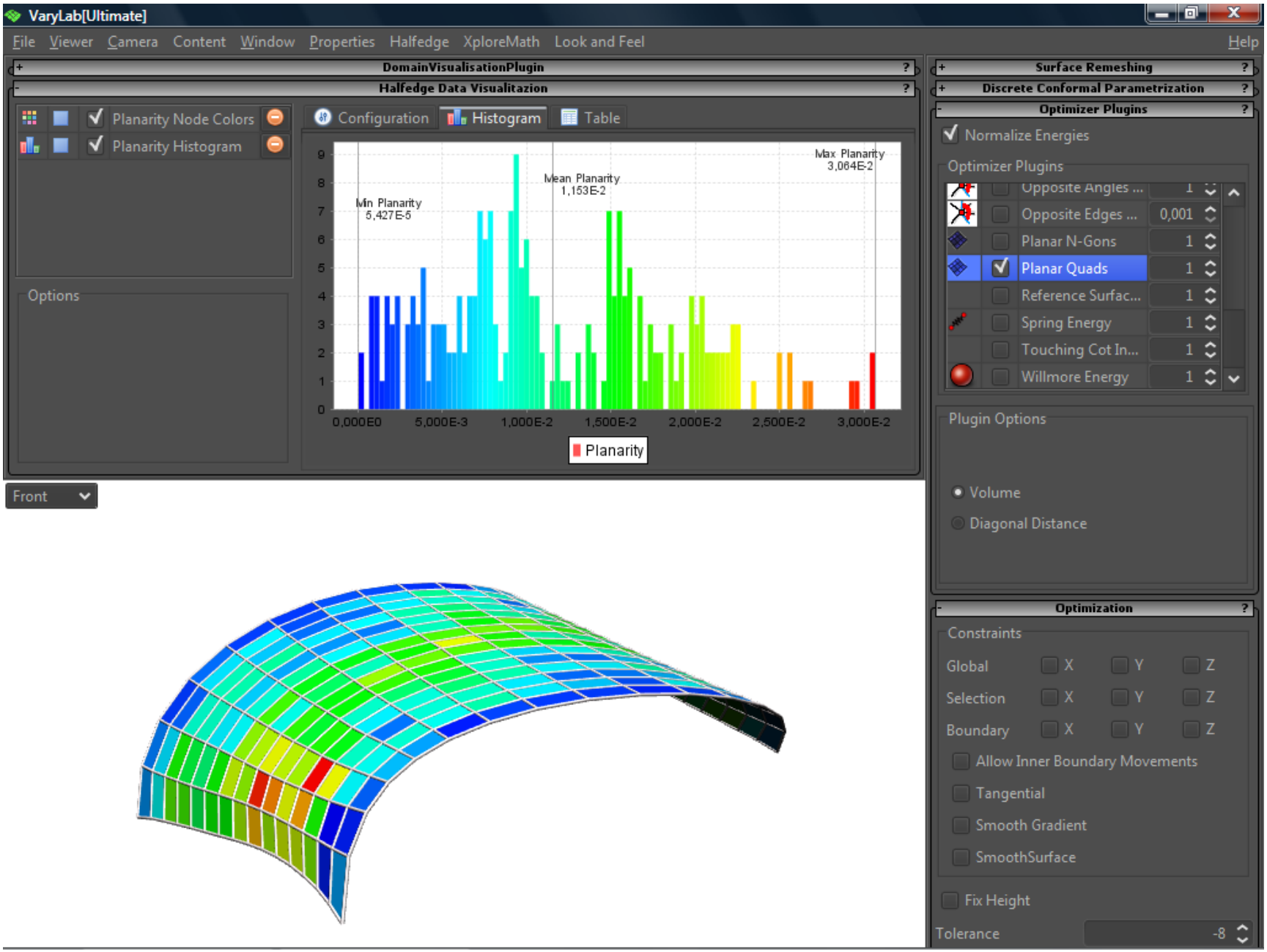
$$\begin{aligned} E(M) &= \sum_{f_i \in M} e(f_i) \\ &= e(f_1) + e(f_2) + \cdots + e(f_n) \end{aligned}$$

Ziel

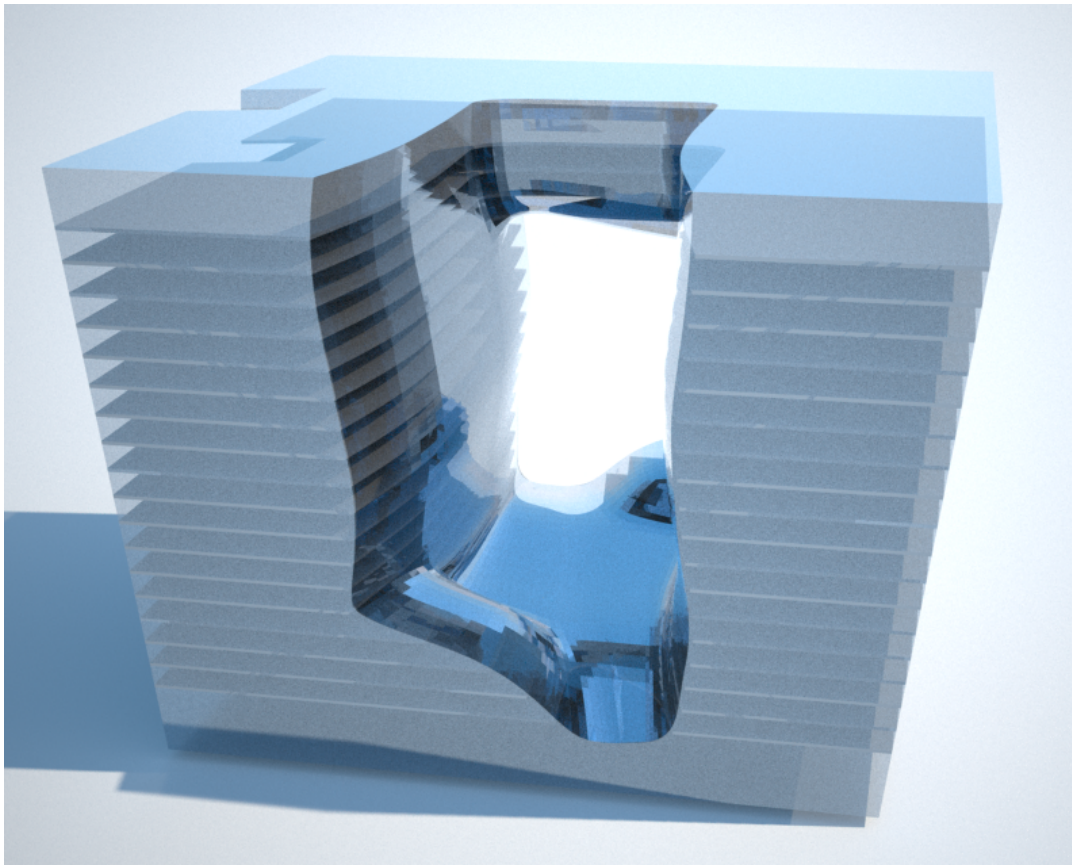
$$\begin{aligned} E(M) &= klein \\ E'(M) &= 0 \end{aligned}$$

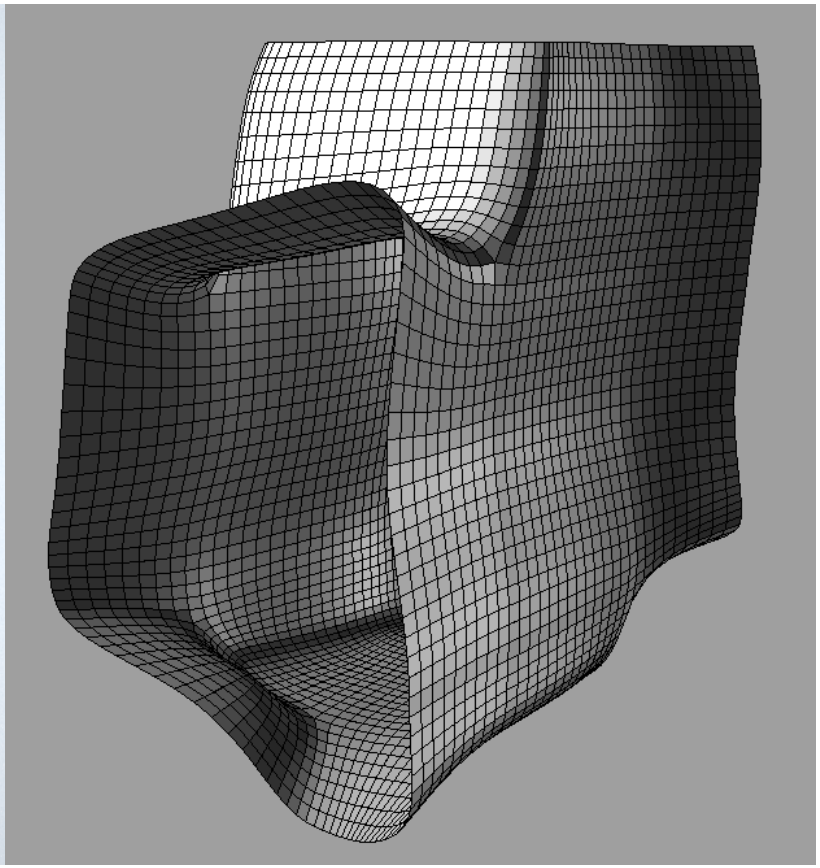

x
x_{n+1}
x_n

Demo Planarisierung



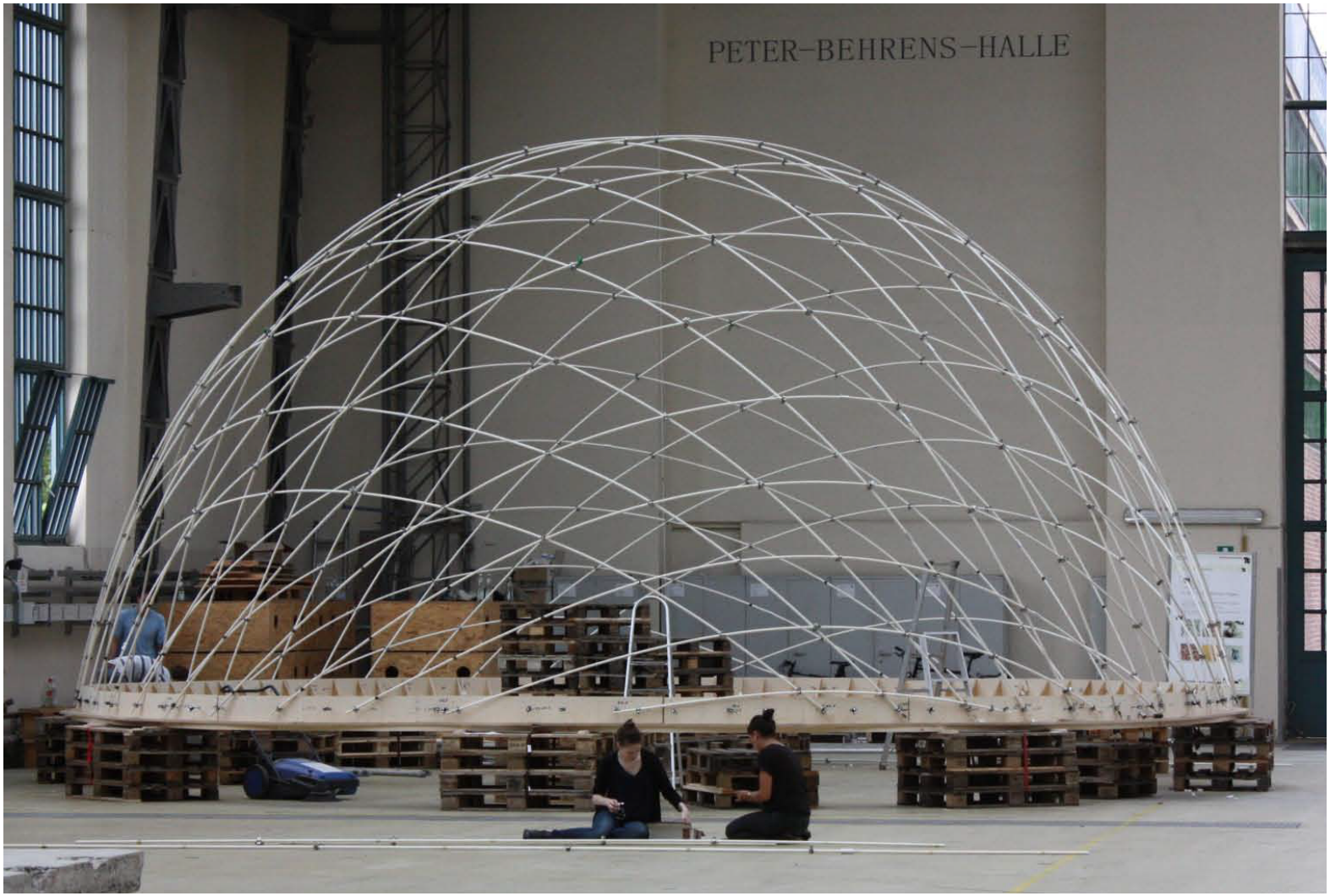
The Opus, Zaha Hadid Architekten 2011





The Opus, Zaha Hadid Architekten 2011


EXPLORE


PETER-BEHRENS-HALLE

$$E = E_{Referenz} + E_{\text{Laenge}} + E_{\text{Kruemmung}}$$