



Aktiven Konturen in MATLAB

Projektarbeit

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A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some of which are solid grey and others are hollow with a grey outline. The lines connecting them are thin and grey, creating a dense, organic structure.

1. **Einleitung**

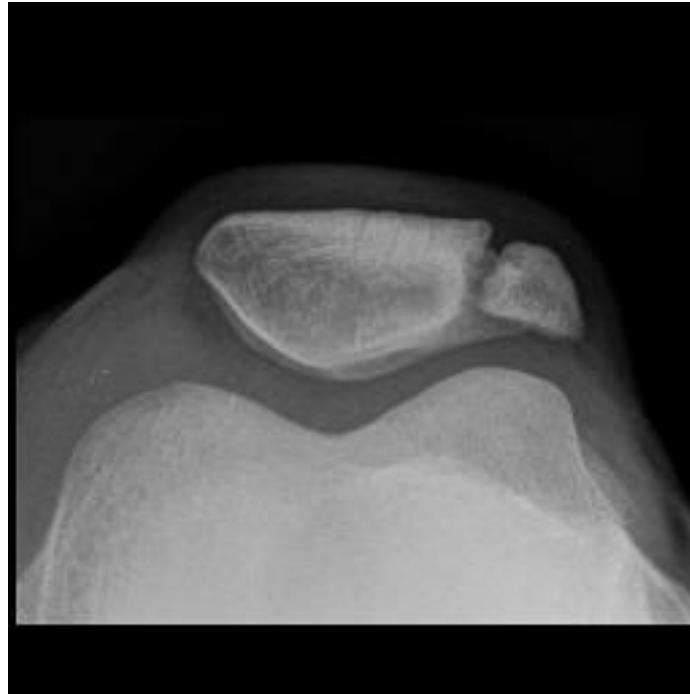
A decorative network diagram in the bottom-right corner, similar to the one in the top-left. It shows a cluster of nodes connected by lines, with some nodes being solid grey and others hollow with grey outlines. The overall pattern is a complex, interconnected web.

Ziel der Projektarbeit

- ◎ Prototyp einer Applikation
 - Erkennung aktiver Konturen
 - Mittels MATLAB
- ◎ Vergleich mit bestehenden Methoden
- ◎ Regionen als zusammenhängend erkennen

Ausgangslage (1)

© Quellbild



Quelle: http://upload.wikimedia.org/wikipedia/commons/3/3d/Patella_bipartita.jpg

Ausgangslage (2)

◎ Zielregion



Quelle: http://upload.wikimedia.org/wikipedia/commons/3/3d/Patella_bipartita.jpg

A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some of which are solid grey and others are hollow with a grey outline. The lines connecting them are thin and grey, creating a dense, organic structure.

2. **Grundlagen**

A decorative network diagram in the bottom-right corner, similar to the one in the top-left. It shows a cluster of nodes (solid grey circles and hollow circles with grey outlines) connected by thin grey lines, forming a complex, interconnected web.

Aktive Konturen

Eine Art
"Gummiband"

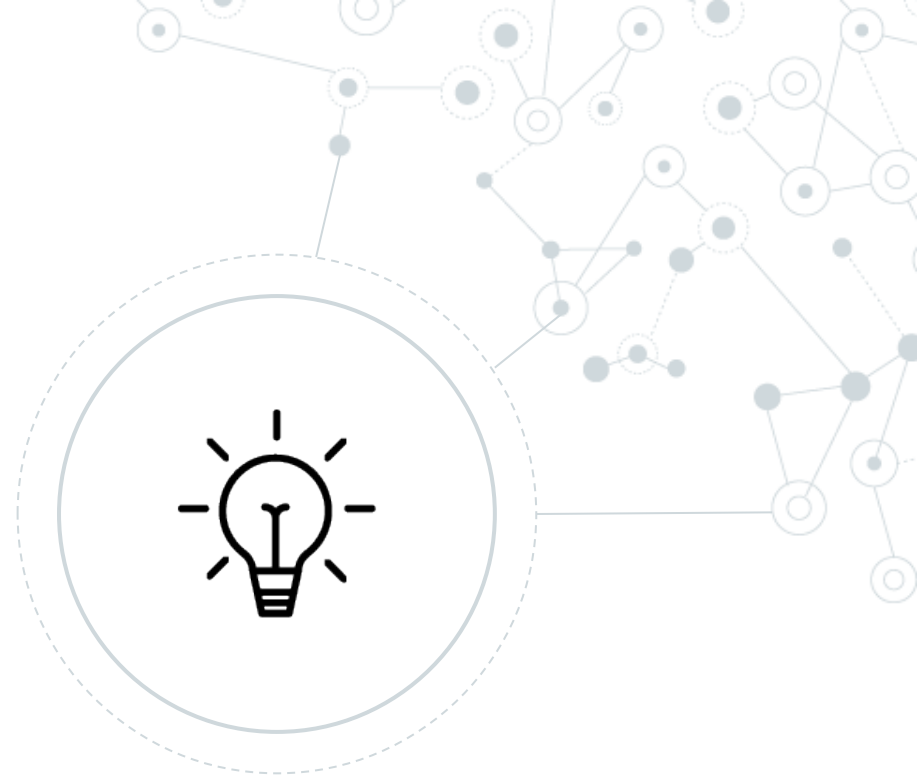


Aktive Konturen

- ◎ Art der Segmentierung
 - modellbasiert
- ◎ Unterteilung in Regionen
 - Zuweisung der Pixel
- ◎ Parametrisierte, geschlossene Kurve
 - $r(s) = (x(s), y(s)), s \in [0, 1]$
- ◎ B-Spline-Kurve

Kräfte

Elastizität, Krümmung
und Bild



Energiefunktion

◎ Berechnung der Kräfte

$$\begin{aligned} E_{snake}^* &= \int_0^1 E_{snake}(v(s)) ds \\ &= \int_0^1 E_{int}(v(s)) + E_{image}(v(s)) + E_{con}(v(s)) ds \end{aligned}$$

$$E_{snake} = \sum_{i=1}^n (\alpha * E_{elas}(p_i) + \beta * E_{curv}(p_i) + \gamma * E_{img}(pv_i))$$

A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by circles of varying sizes, some with concentric rings, and the lines are thin and grey. The diagram is partially cut off by the left edge of the slide.

3. **Umsetzung**



Herausforderungen



MATLAB

Klassen

Programmier-Konzepte

Globals



Parameter

Elastizität

Kurvatur

Bildkräfte



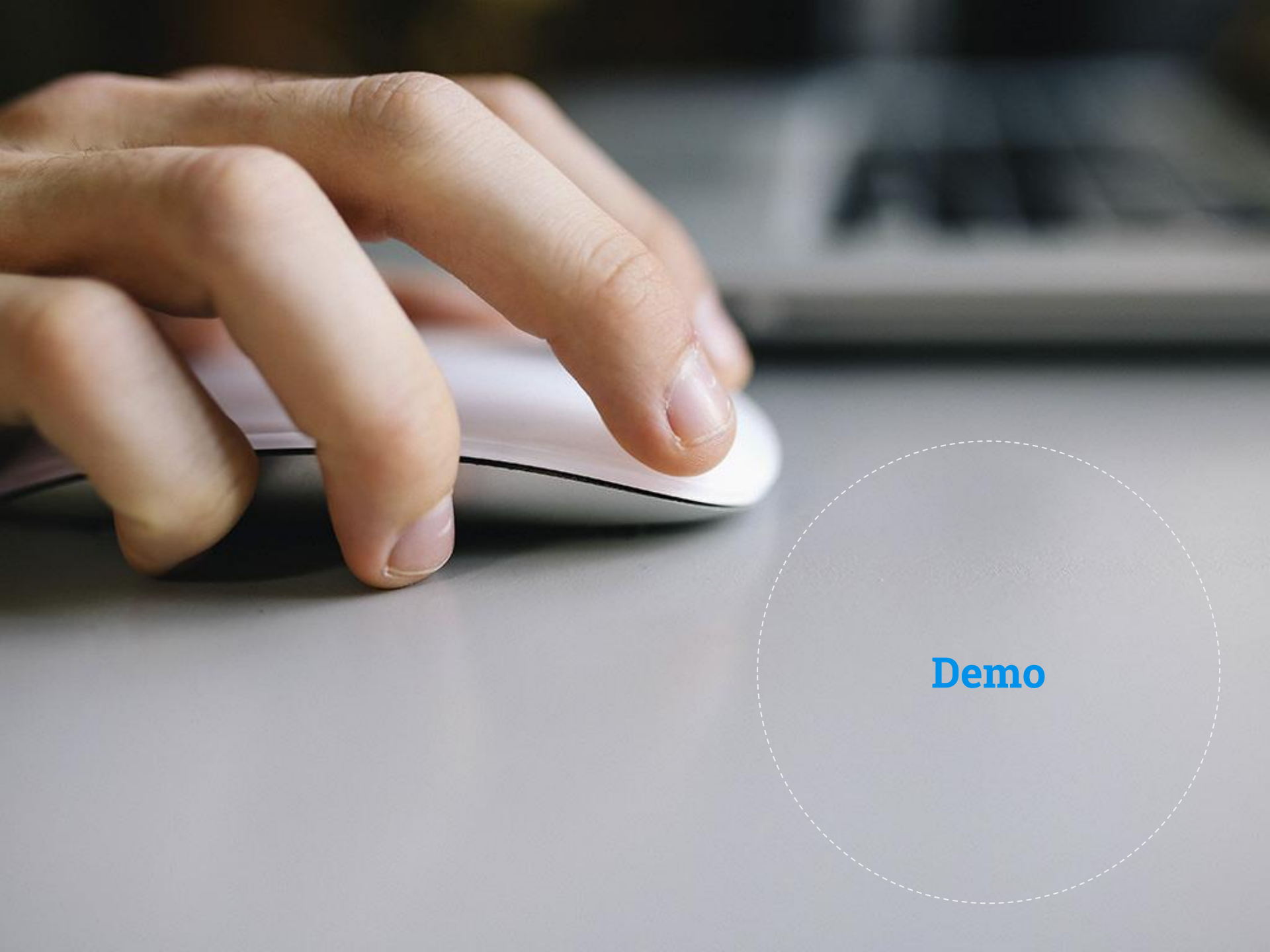
Bildverarbeitung

Graustufen

Gauss

Kantenbasiert





Demo

A decorative network diagram in the top-left corner, featuring a complex web of interconnected nodes and lines. The nodes are represented by small circles, some of which are solid dark grey, while others are hollow with a light grey outline. The lines connecting them are thin and light grey, creating a dense, organic structure.

4. **Fazit**

A decorative network diagram in the bottom-right corner, similar to the one in the top-left. It consists of a cluster of nodes and connecting lines. The nodes are small circles, some solid dark grey and some hollow with light grey outlines, connected by thin, light grey lines.

Fazit & Ausblick



Vertiefung

MATLAB

Experimentieren



MATLAB

Vergleich(e)



Chan & Vese

Danke!

Fragen?

