[1] Picture by Satya Mallick.

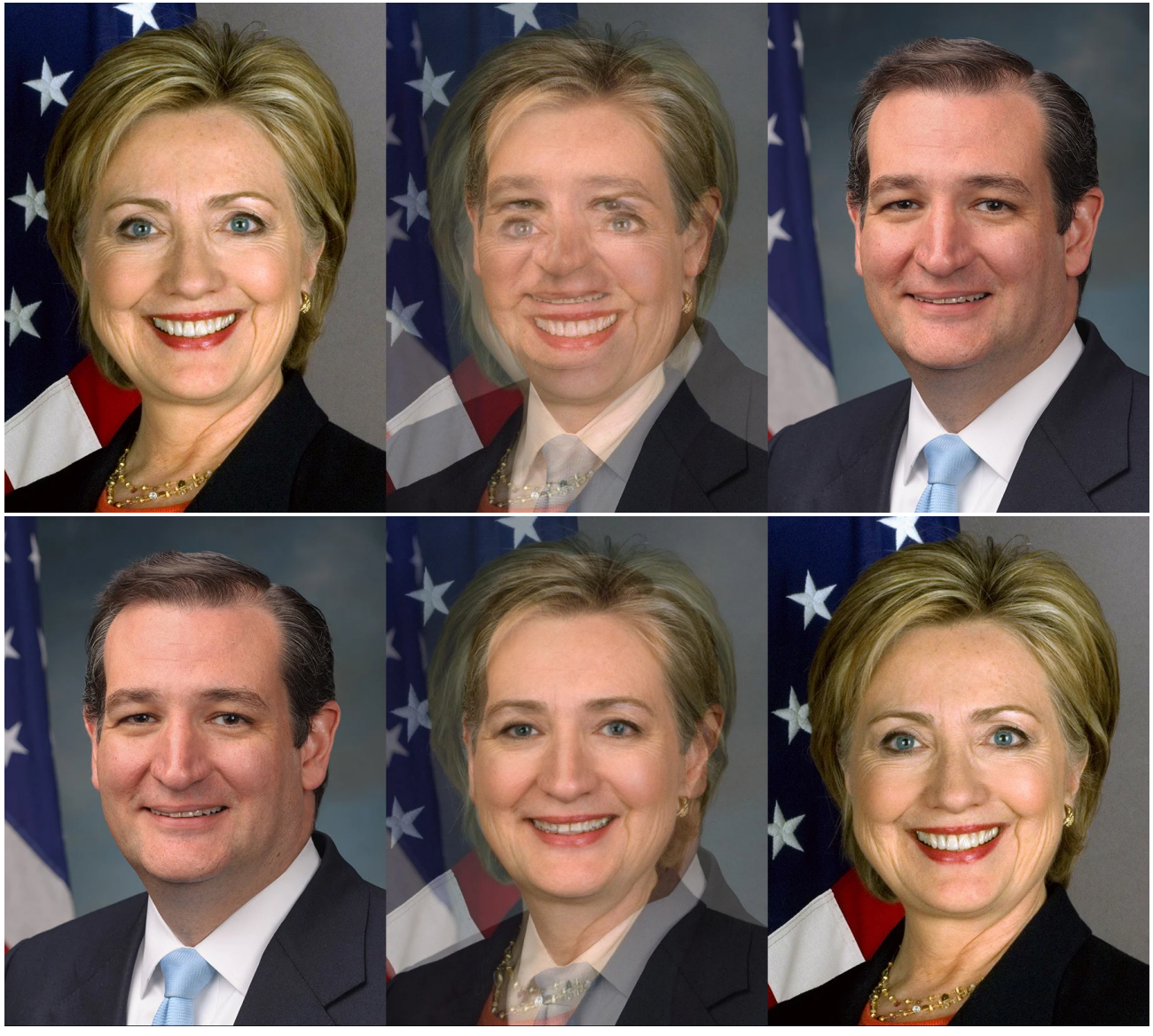


Figure: Image Morphing. [1]

[1] Picture by Satya Mallick.

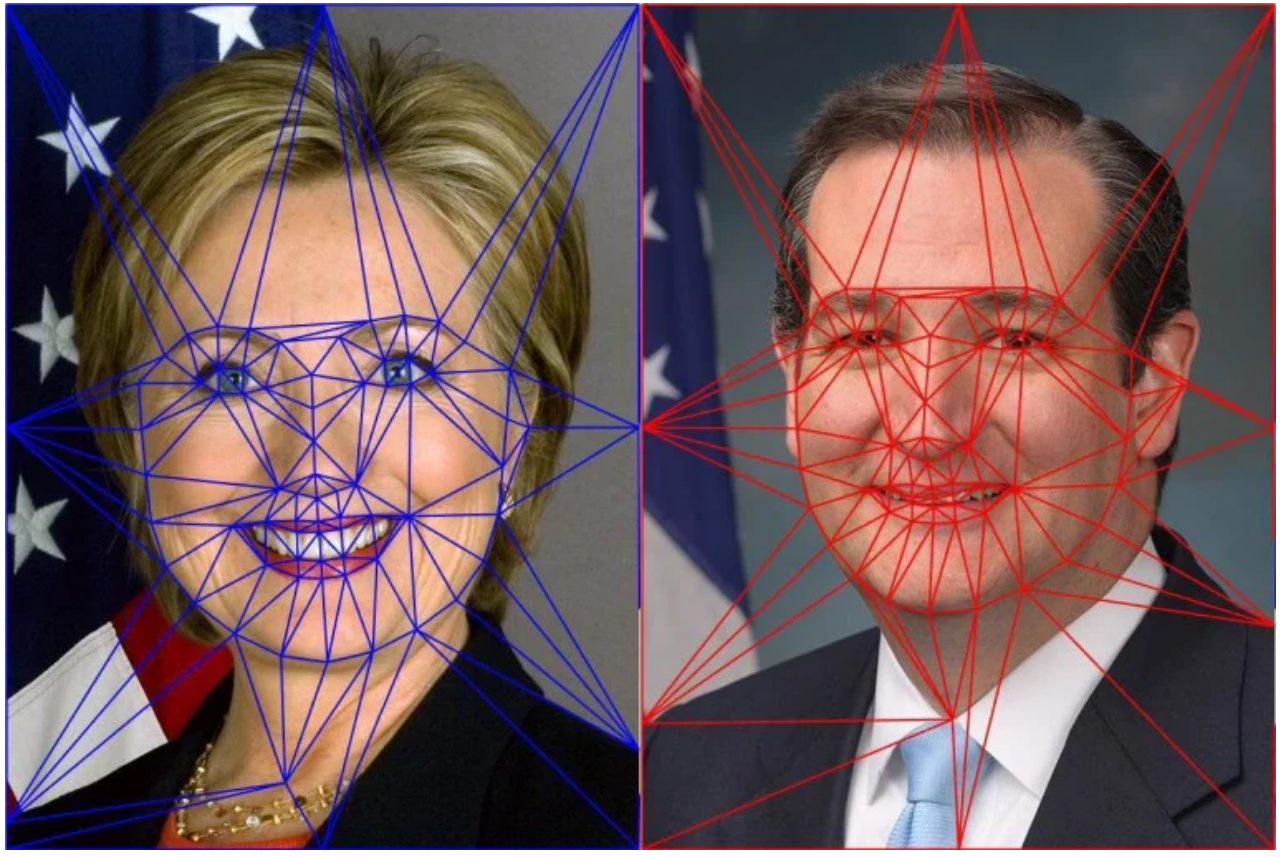


Figure: Image Morphing. [2]

[2] Picture by Satya Mallick.

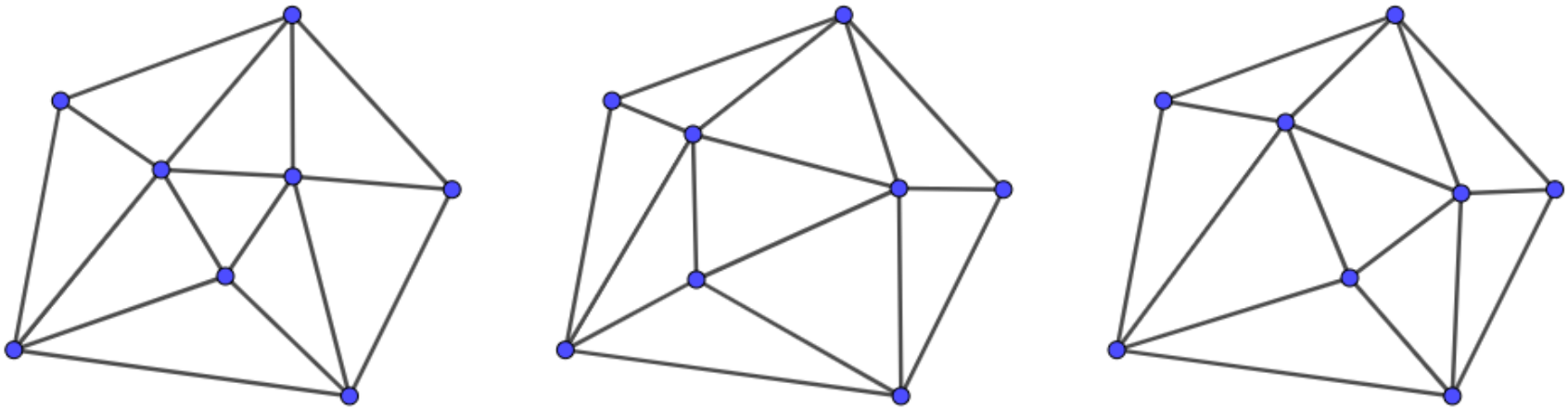
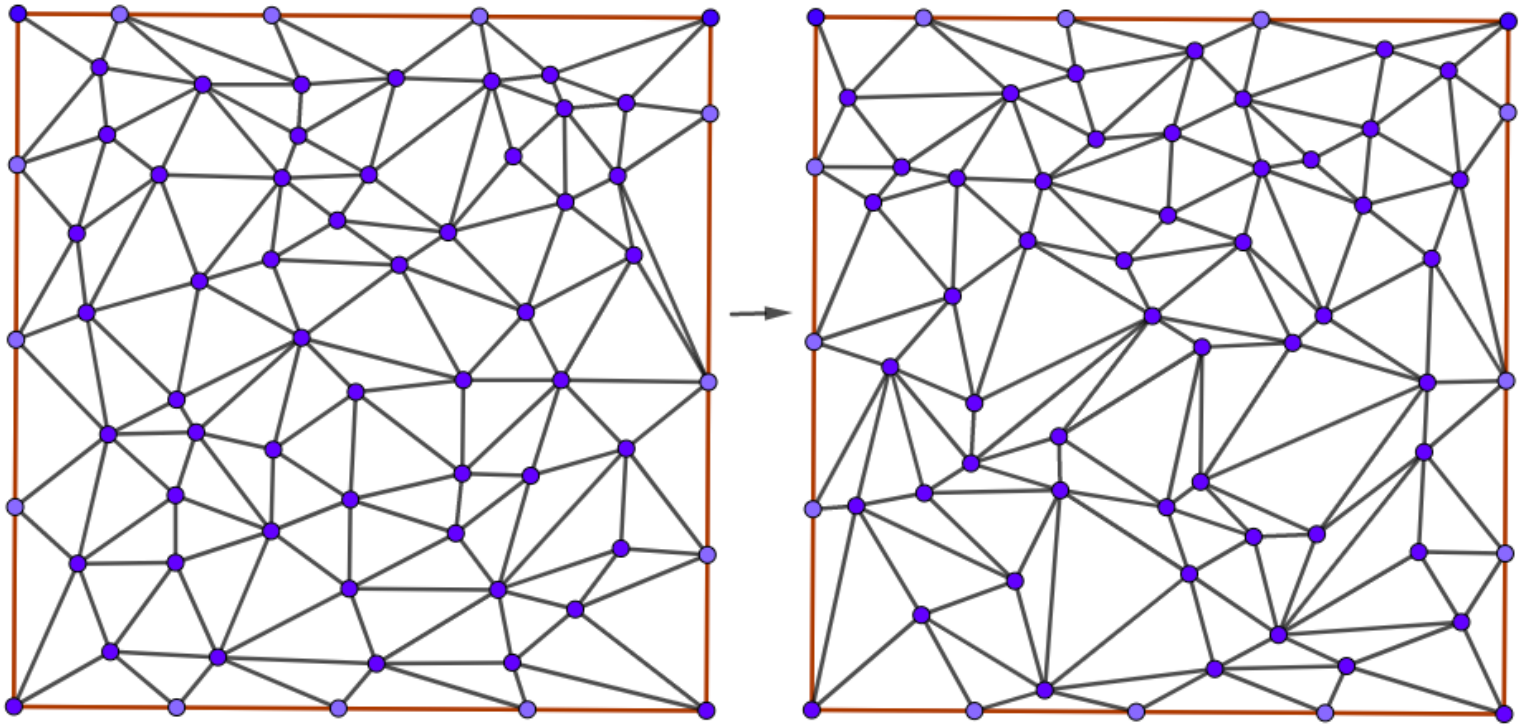


Figure: Elements in a space of geodesic triangulations X.

$X = X(\mathbb{D}^2, T)$ is a six dimensional manifold.

Is X connected? What is the homotopy type of X?



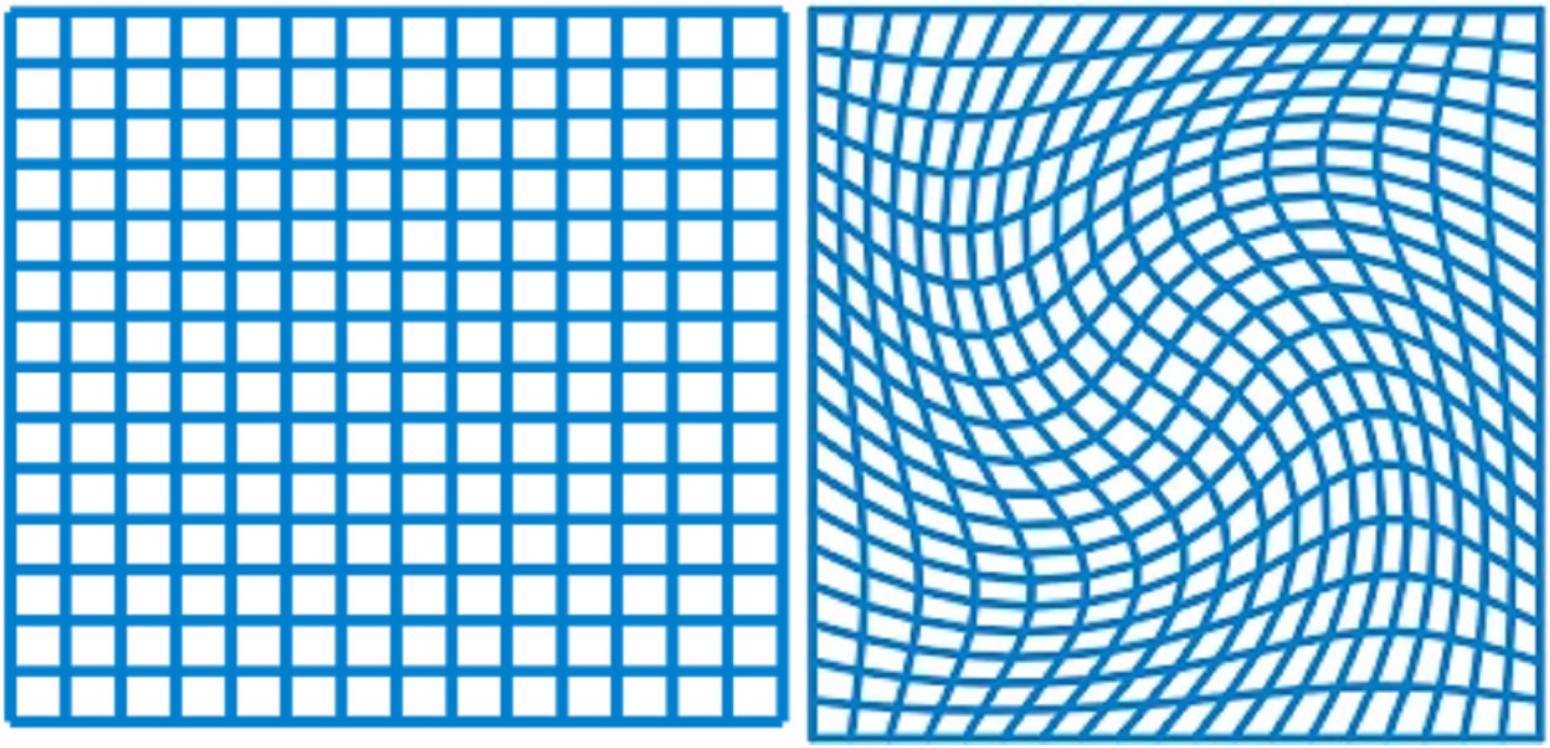
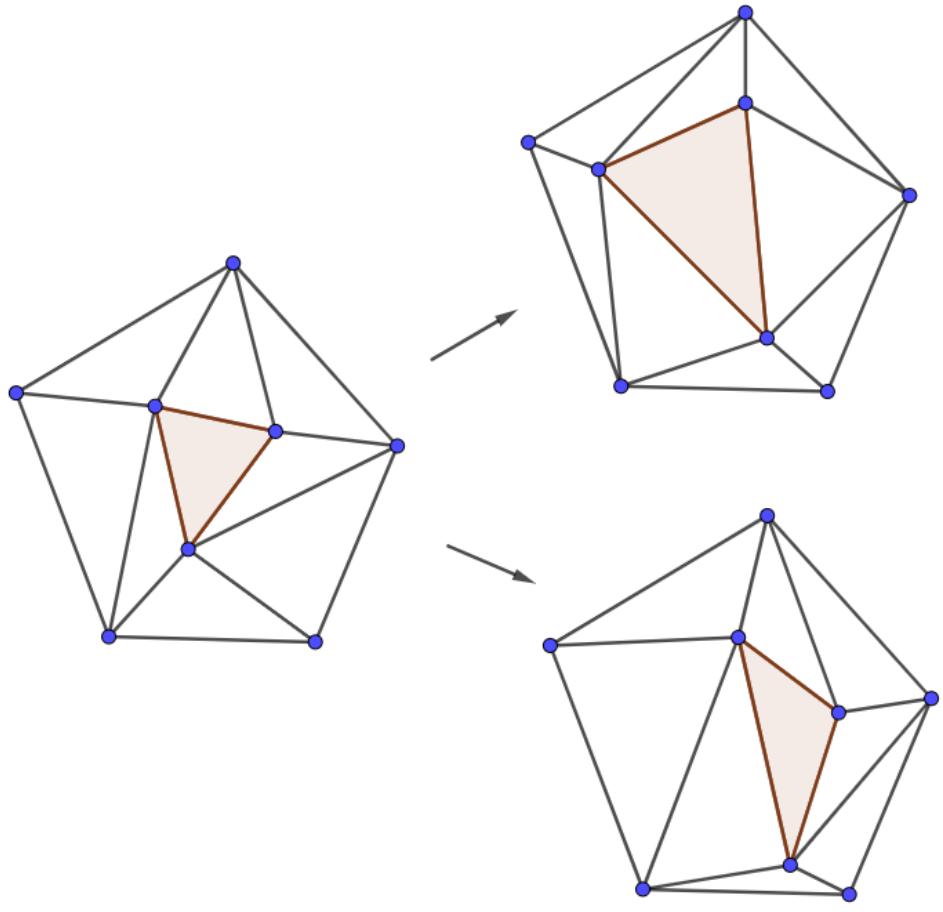


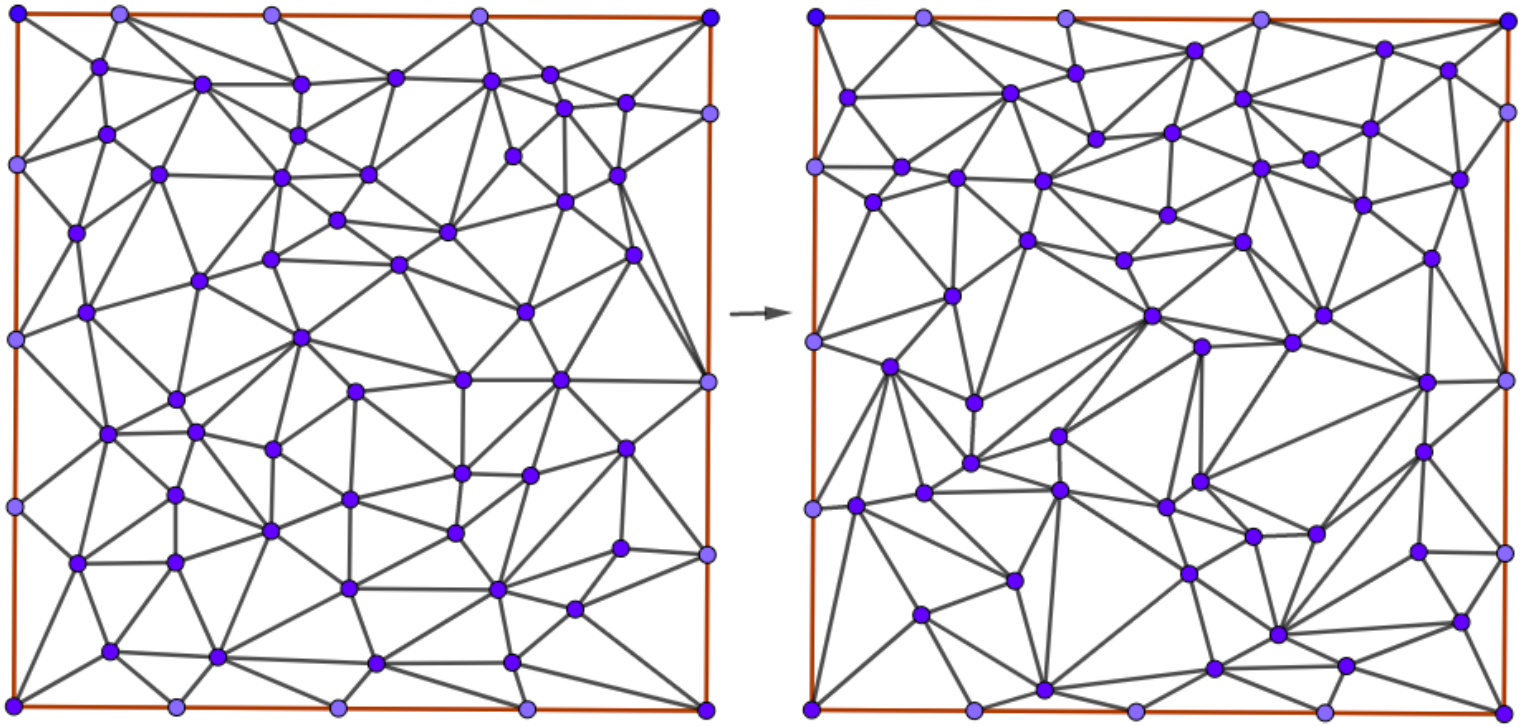
Figure: A diffeomorphism of the square[3]

$Diff(\mathbb{D}^2)$ - the diffeomorphisms group fixing $\partial\mathbb{D}^2$ pointwise.

[3]Figure: Wikipedia



$X(\mathbb{D}^2, T) = \{\text{simplexwise linear homeomorphisms}\}$



$X(\mathbb{D}^2, T)$ as an approximation of $\mathit{Diff}(\mathbb{D}^2)$.

Question:

$$\mathit{Diff}(\mathbb{D}^2) \simeq X(\mathbb{D}^2, T)\textbf{?}$$

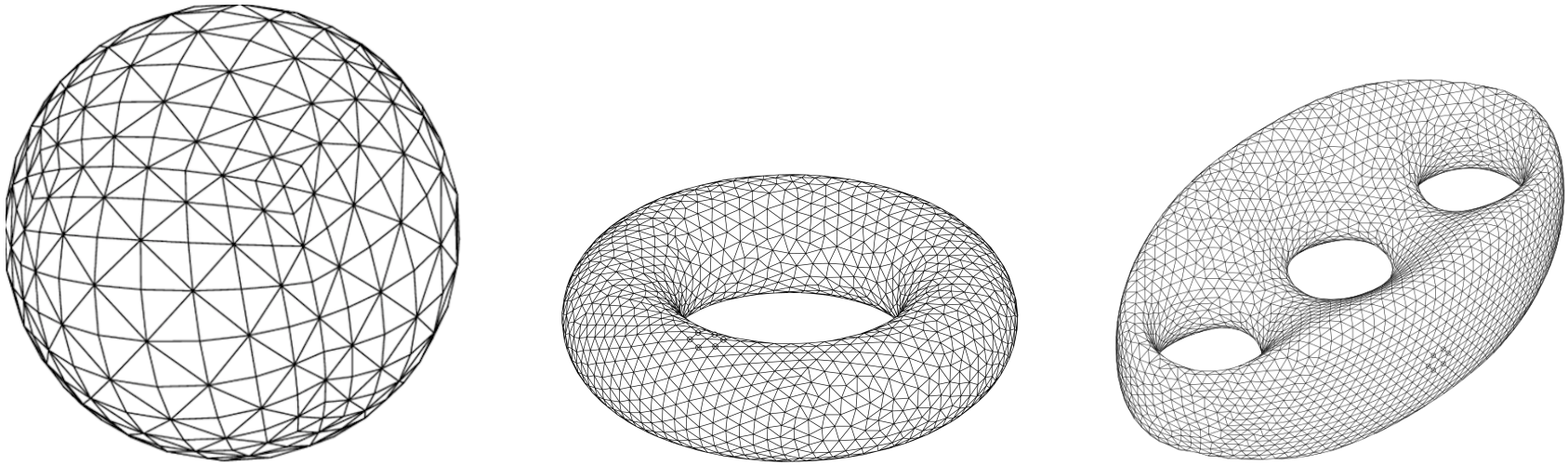


Figure: Triangulations of surfaces. [4]

[4] Picture by Gustavo Montero and Wiki.

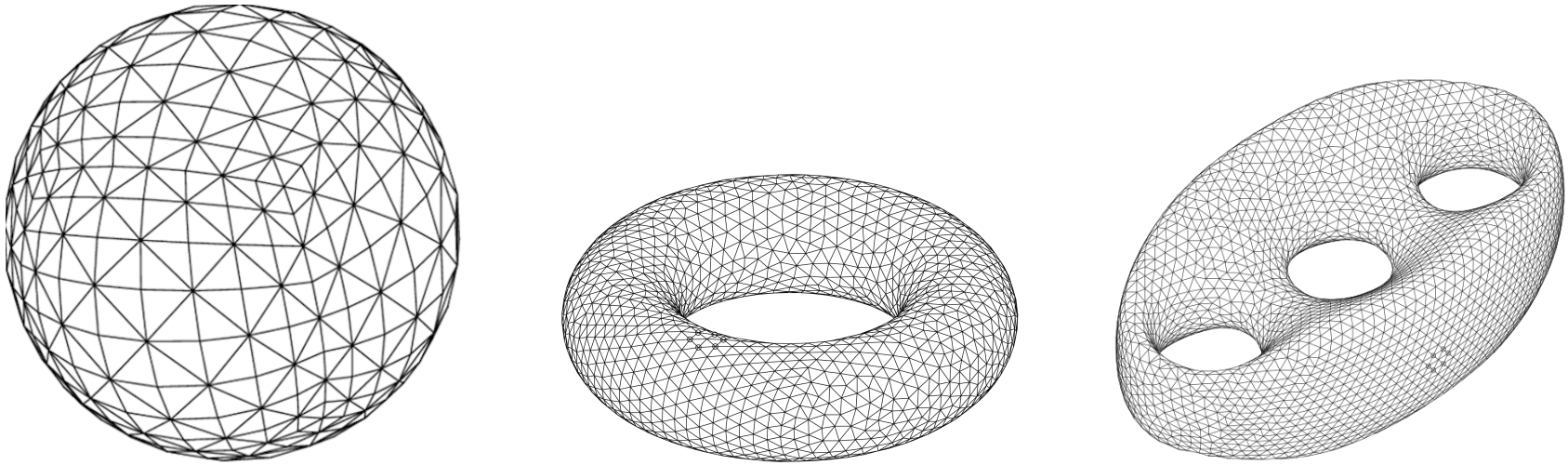


Figure: Triangulations of surfaces. [4]

$X(S, T)$ - *spaces of geodesic triangulations*.

[4] Picture by Gustavo Montero and Wiki.

Conjecture (Connelly-Henderson-Ho-Starbird 1984)

$$Diff(S) \simeq X(S, T).$$

Surface S	$Diff(S)$	$Diff(S) \simeq X(S, T)$?
$\mathbb{D}^2$	$*$	Yes (1984)
$\mathbb{S}^2$	$SO(3)$	
$\mathbb{T}^2$	$\mathbb{T}^2$	
S_g	$*$	

Conjecture (Connelly-Henderson-Ho-Starbird 1984)

$$Diff(S) \simeq X(S, T).$$

Surface S	$Diff(S)$	$Diff(S) \simeq X(S, T)$
$\mathbb{D}^2$	$*$	Yes (BCH,1984) and No(L, 2020)
$\mathbb{S}^2$	$SO(3)$	Open
$\mathbb{T}^2$	$\mathbb{T}^2$	Yes (EL, 2021, LWZ, 2021)
S_g	$*$	Yes (LWZ, 2021)