The Hausdorff distance
If \( X \) and \( Y \) are two subsets of the same metric space, then the Hausdorff distance between them is

\[
d_H (X, Y) = \inf \{ \varepsilon > 0 \mid X \subseteq Y^\varepsilon \text{ and } Y \subseteq X^\varepsilon \}\]
The Gromov-Hausdorff distance

If $X$ and $Y$ are two metric spaces, then the Gromov-Hausdorff distance between them is

$$d_{GH}(X, Y) = \inf \left\{ \frac{1}{2} \left( d_H^2(X, Z) + d_H^2(Y, Z) \right) : X \rightarrow Z, Y \rightarrow Z \right\}$$