Nash isometric embedding theorem

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Every compact n-dimensional Riemannian manifold M of class C^k ($3 \leq k \leq \infty$) can be C^k-isometrically imbedded in any small portion of a Euclidean space $\mathbb{R}^N$, where

$$N = \frac{1}{2}n(3n + 11).$$

Every non-compact n-dimensional Riemannian manifold M of class C^k ($3 \leq k \leq \infty$) can be C^k-isometrically imbedded in any small portion of a Euclidean space $\mathbb{R}^N$, where

$$N = (n + 1)\frac{1}{2}n(3n + 11).$$

The original proof due to Nash relying on an iteration scheme has been considerably simplified. For an overview, see [**?**].

References

[1] Nash, J. F., *The imbedding problem for Riemannian manifold*, Ann. of Math. 63 (1956), 20–63 (MR 17, 782)

[2] D. Yang, *Gunther's proof of Nash's isometric embedding theorem*, `http://www.math.poly.edu/ yang/papers/gunther.pdf`online