

## **Averaging submanifolds in riemannian manifolds**

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How can one define the "average" of two or more nearby (unparametrized) space curves in a way which is invariant under interchange of the curves? This innocent-looking question turns out to be suprisingly hard to answer. (Readers of this abstract are invited to present their proposals at the Colloquium.) I will describe several approaches which have not (yet) worked and one which has, but which is still far from optimal. More generally, I will present an averaging theorem for submanifolds of riemannian manifolds, and an application to finding invariant manifolds for actions of compact groups.