Tangent algebra of a diffeomorphism group and its application

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In this talk the notion of the tangent algebra of a (not necessarily smooth) subgroup of the diffeomorphism group $Diff(M)$ of a compact manifold M is introduced. We prove that this tangent algebra is a Lie subalgebra of the Lie algebra of smooth vector fields on M. The construction can be generalized to subgroups of any (finite or infinite dimensional) Lie groups. The tangent Lie algebra introduced this way is a generalization of the classical Lie algebra in the smooth case. As a working example, we discuss in detail the tangent structure of the holonomy group and the fibered holonomy group of Finsler manifolds.