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<http://atlas.mat.ub.es/sga>

Introduction to deformation theory

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We will illustrate some of the methods of deformation theory by studying the particular case of the Hilbert scheme which parametrizes closed subschemes of projective space. We study infinitesimal deformations over the ring of dual numbers, and the obstructions to extending them to deformations over more general Artin rings. This leads to a criterion for the Hilbert scheme to be smooth. As an application we show that for any locally Cohen-Macaulay curve in \mathbb{P}^3 of degree d , the dimension of the Hilbert scheme is $\geq 4d$.

Reference: Lecture notes Ch I-IV at math.berkeley.edu/~robin.
