

# Branching diffusion representation of nonlinear PDEs

**Nizar Touzi**<sup>1</sup>

<sup>1</sup> École Polytechnique, France

We provide a representation of the solution of a semilinear partial differential equation by means of a branching diffusion. Unlike the backward SDE approach, such a representation induces a purely forward Monte Carlo method. We also provide applications to the unbiased simulation of stochastic differential equations, and extensions to general initial value problems.