

Forward-Backward SDEs and Neural Networks in Heterogeneous Household Wealth Models

Avi Mayorcas

The Aiyagari model and its variants have been the workhorse of micro-founded macroeconomic models for over 30 years and continue to play an important role in macro-economic modelling and policy making. In recent decades mathematicians have begun collaborating with economists to study models of this type set in continuous time. In this talk I will present ongoing work, joint with S. Ellingsrud, F. Harang, A. Irrarazzabal (BI Oslo) and C. Cheng (IMI-Bath), on a forward-backward SDE formulation of the most basic stochastic variant of these models in both life-cycle and overlapping generations setting. This formulation allows for intuitive, semi-explicit expressions, relatively straightforward proofs of existence and uniqueness of solutions and application of novel, neural network based approximations. I will discuss future horizons and possible extensions to more complex micro-founded models.