Nonlocal-in-time evolution equations

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In this talk, we first introduce some classes of nonlocal-in-time evolution equations in interpolation scales of Banach spaces and show a well-posedness result for them. We will do this by going through old and new results for the linear and semilinear Cauchy problems associated with those integrodifferential equations. As an application, we obtain the local well-posedness for a model describing a viscoelastic fluid with memory. Secondly, we use fractional-in-time diffusion equations to illustrate how the qualitative analysis of solutions can go further for nonlocal-in-time evolution equations and some of their difficulties.