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“Mild solutions” and variation of constants formula for delay differential equations

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The method and the formula of variation of constants for ordinary differential equations (ODEs) is a fundamental tool to analyze the dynamics of an ODE near an equilibrium. It is natural to expect that such a formula works for delay differential equations (DDEs), however, it is well-known that there is a conceptual difficulty in the formula for DDEs. In this talk, we discuss the variation of constants formula for DDEs by introducing the notion of a *mild solution*, which is a solution under an initial condition having a discontinuous history function.