# Numerical method for solving special Cauchy problem for the second order integro-differential equation

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In the present communication we conserved the special Cauchy problem for the second order integro-differential equation

$$\frac{d^2x}{dt^2} = A_1(t)\frac{dx}{dt} + A_2(t)x(t) + \varphi_1(t)\int_0^T \psi_1(\tau)f_1(\tau,\dot{x}(\tau))d\tau + \varphi_2(t)\int_0^T \psi_2(\tau)f_2(\tau,x(\tau))d\tau + g(t) \quad (1)$$

where the $A_1(t), A_2(t), \varphi_1(t), \varphi_2(t), \psi_1(\tau), \psi_2(\tau)$ are continuous on $f : [0,T] \times \mathbb{R}^n \to \mathbb{R}^n$, is continuous.

A solution to equation (1) is continuosly differentable on [0,T] function $x(t) \in C([0,T], R^n)$, which satisfies equation for any $t \in [0,T]$.

Equation (1) adduce to special Cauchy problem by the Dzhumabaev parametrization method. An iterative method is proposed to solve a special Cauchy problem. The iterative method is implemented numerically.

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