

系统工程

灰色离散Verhulst模型

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摘要:

针对传统灰色Verhulst模型适应性不强的情况, 借鉴离散化思想, 通过对原始数据序列进行倒数生成, 建立了灰色离散Verhulst模型。灰色离散Verhulst模型充分考虑了数据序列的准指数规律, 实现了从连续形式向离散形式的转变, 消除了传统灰色Verhulst模型由微分方程直接跳到差分方程所产生的误差。同时给出了两种初始条件下的灰色离散Verhulst模型的预测公式, 有效地解决了传统灰色Verhulst模型预测稳定性差的问题。实例分析表明, 灰色离散Verhulst模型能够显著提高模拟和预测效果。

关键词: 灰色系统理论 灰色Verhulst模型 离散化 预测精度

Grey discrete Verhulst model

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Abstract:

Aiming to the imperfect adaptability of the traditional grey Verhulst model, using discretization thought for reference, a grey discrete Verhulst model is constructed by reciprocal generation of the original data sequence. The grey discrete Verhulst model gives full consideration to the quasi exponential law, realizes changes from continuous form to discrete form, and eliminates jumping errors from the differential equation to the difference equation. The prediction formulas of the grey discrete Verhulst model are given under two initial conditions, which effectively solves the traditional problem of low predicted stability. The final adoption of an example shows that the model can significantly improve simulation and prediction accuracy.

Keywords: grey system theory grey Verhulst model discretization forecast precision

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