

研究、探讨

## 改进GP分形理论的最近邻序列预测算法

吕威<sup>1</sup>, 马维旻<sup>1</sup>, 毕全成<sup>1</sup>, 黄健聪<sup>2</sup>

1.北京师范大学珠海分校 信息技术学院, 广东 珠海 519085

2.中山大学 软件研究所, 广州 510275

收稿日期 2009-8-11 修回日期 2009-9-16 网络版发布日期 2009-12-4 接受日期

**摘要** 针对现有的时间序列分析和预测算法中主观性太强的缺点, 借助分形理论对时间序列作有效的分析。改进了分形理论中的GP算法和复自相关法的计算方式, 从而使之更适合相空间的重构和预测, 然后在重构后的相空间中选择累积采样轨迹的最近邻点作一次性的序列预测。提出的算法避免了人工过多的干预调整, 通过在两个具体时间序列数据集上的验证, 与其他预测算法相比, 该算法的分析结果稳定而准确、预测精度高、运行时间比较短。

**关键词** [时间序列](#) [分形](#) [GP算法](#) [复自相关](#) [最近邻预测](#)

**分类号** [TP301.6](#)

## Nearest neighbor series predicate algorithm based on improved GP fractal theory

LV Wei<sup>1</sup>, MA Wei-min<sup>1</sup>, BI Quan-cheng<sup>1</sup>, HUANG Jian-cong<sup>2</sup>

1.School of Information Technology of Beijing Normal University Zhuhai Campus, Zhuhai, Guangdong 519085, China

2.Software Research Institute of Zhongshan University, Guangzhou 510275, China

### Abstract

This paper analyzes the disadvantage that the subjectivity is too strong in existing time serials and predicate method. The fractal theory is used for the time series prediction. The computing of GP algorithm and multiple autocorrelation algorithm are improved, and the reconstruction of the phase space is easier. After that the nearest neighbor of accumulation sampling path is selected for one time predicate in phase space. The new algorithm is more suited to reconstruction and predicting in the phase space. By validating at two time series dataset, the analysis result of this method is steady and exact, predication precision of it is high and the running time is short.

**Key words** [time series](#) [fractal](#) [Genetic Programming \(GP\) algorithm](#) [multiple autocorrelation](#) [nearest neighbor predicate](#)

DOI: 10.3778/j.issn.1002-8331.2009.33.011

通讯作者 吕威 [luwei00@126.com](mailto:luwei00@126.com)

### 扩展功能

#### 本文信息

▶ [Supporting info](#)

▶ [PDF\(786KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

#### 服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

#### 相关信息

▶ 本刊中 [包含“时间序列”的相关文章](#)

▶ 本文作者相关文章

- [吕威](#)
- [马维旻](#)
- [毕全成](#)
- [黄健聪](#)