

Accepted Manuscript

Title: Learning Automata Clustering

Authors: Mohammad Hasanzadeh-Mofrad, Alireza Rezvanian

PII: S1877-7503(17)30224-7
DOI: <http://dx.doi.org/10.1016/j.jocs.2017.09.008>
Reference: JOCS 761



To appear in:

Received date: 28-2-2017
Revised date: 8-9-2017
Accepted date: 14-9-2017

Please cite this article as: Mohammad Hasanzadeh-Mofrad, Alireza Rezvanian, Learning Automata Clustering, Journal of Computational Science <http://dx.doi.org/10.1016/j.jocs.2017.09.008>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Learning Automata Clustering

Mohammad Hasanzadeh-Mofrad ^{a*} and Alireza Rezvanian ²

^a *School of Computing and Information, Department of Computer Science, University of Pittsburgh, Pittsburgh, US*

School of Computer Science, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran

* Corresponding author.

E-mail address: mohammad.hmofrad@pitt.edu.

mohammad.hmofrad@pitt.edu and a.rezvanian@aut.ac.ir

Abstract

Clustering of data points has been a profound research avenue in the history of machine learning algorithms. Using learning automata which are autonomous decision making entities, in this paper, the learning automata clustering algorithm is proposed. In learning automata clustering, each data point is affiliated with a learning automaton where the learning automaton determines the cluster membership of that data point. The cluster rectification is done through a reinforcement signal for each learning automaton which is fabricated from the Euclidean distance of that data point and the mean value of its designated cluster. Finally, the learning automata clustering is compared with four centroid-based clustering algorithms, K-means, K-means++, K-medians, and K-medoids and results demonstrate the high clustering accuracy and comparable Silhouette coefficient of the proposed method.

keywords: reinforcement learning; learning automata; machine learning; clustering algorithm.

1. Introduction

Starting from mid 1950s, researchers have been trying to devise new machine learning algorithms [1] to solve conflated problems using loosely defined computational frameworks. From the beginning of the 21st

Download English Version:

<https://daneshyari.com/en/article/6874470>

Download Persian Version:

<https://daneshyari.com/article/6874470>

[Daneshyari.com](https://daneshyari.com)