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Artificial Intelligence in Medicine 30 (2004) 215–232

Artificial Intelligence in Medicine

www.intl.elsevierhealth.com/journals/aiim

A comparison of learning algorithms for Bayesian networks: a case study based on data from an emergency medical service

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Received 2 June 2002; received in revised form 10 November 2002; accepted 23 June 2003

Abstract

Due to the uncertainty of many of the factors that influence the performance of an emergency medical service, we propose using Bayesian networks to model this kind of system. We use different algorithms for learning Bayesian networks in order to build several models, from the hospital manager's point of view, and apply them to the specific case of the emergency service of a Spanish hospital. This first study of a real problem includes preliminary data processing, the experiments carried out, the comparison of the algorithms from different perspectives, and some potential uses of Bayesian networks for management problems in the health service.

Keywords: Bayesian networks; Learning algorithm; Scoring functions; Independence; Emergency medical service; Management decision support in the health service

1. Introduction

Over the past four decades, a lot of effort has been put into developing medical decision support systems. There is a great variety of commercially available programs to assist clinicians with diagnosis, decision-making, pattern recognition, medical reasoning, filtering, etc. both for general and very specialized domain applications. In recent years,

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0933-3657/$ – see front matter
doi:10.1016/j.artmed.2003.11.002