

بسم الله الرحمن الرحيم

Sudan University of Science and Technology

College of Graduated Studies

Classification Algorithms Comparison- Case Study: Cancer
Patients(SEER Data Set)

مقارنة خوارزميات التصنيف - دراسة حالة: مرضي السرطان

By

Musab Abd algader Abd alkreem

Supervisor

Dr. Mohamed Elhafiz Mustafa Musa

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ABSTRACT

Data mining is the automatic search of huge data to discover patterns and trends that go beyond simple analysis. Data mining is also known as Knowledge Discovery in Data (KDD). This study investigates the discovery of the survival rate or survivability of a certain disease is possible by extracting the knowledge from the data related to that disease. To do such investigate a large data set needed one of these data sources is SEER[1] (Surveillance Epidemiology and End Results), which is a unique, reliable and essential resource for investigating the different aspects of cancer. In this study we have investigated three data mining techniques Multilayer Perceptron (MLP), K-nearest neighbor and the C4.5 decision trees the goal is to find the best accuracy to predict 5 years survivability of breast cancer.

SEER database (period of 1973-2009 with 657,712 records) were used, starting from previous study we determined common variables use, after preprocessed there are 18 variables and 180,302 records.

Weka was used to train and test the three techniques. The result show that the best technique is C4.5 accuracy is %95.6 and the second technique is K-nearest neighbor with accuracy %95.4 and the worst is MLP with accuracy %95.3.

المستخلص

تنقيب البيانات هو البحث التلقائي في بيانات ضخمة لاكتشاف الأنماط والاتجاهات. وكما هو معروف تنقيب البيانات جزء من اكتشاف المعرفة في البيانات (KDD). تبحث هذه الدراسة في المقارنة بين ثلاثة مصنفات (Classifiers) اكتشاف معدل البقاء على قيد الحياة عن طريق استخراج المعرفة من البيانات المتعلقة بهذا المرض. للقيام بمثل هذا التحقيق مجموعة كبيرة من البيانات المطلوبة واحدة من هذه المصادر البيانات [1 SEER] (مراقبة الأوبئة والنتائج النهائية)، والذي هو مورد فريد وموثوق بها والضرورية للتحقيق في جوانب مختلفة من السرطان. في هذه الدراسة قمنا بالتحقيق ثلاث تقنيات استخراج البيانات متعدد الطبقات المتعرف ((MLP، K-أقرب جار والأشجار قرار C4.5 الهدف هو العثور على أفضل دقة للتنبؤ ٥ سنوات البقاء على قيد الحياة لسرطان الثدي. واستخدمت قاعدة بيانات برنامج سير (فترة ١٩٧٣-٢٠٠٩ مع ٦٥٧٧١٢ سجلات)، بدءا من دراسة سابقة قررنا المتغيرات المشتركة استخدام، بعد preprocessed هناك ١٨ المتغيرات و١٨٠٣٠٢ السجلات. كان يستخدم لتدريب ويدا واختبار التقنيات الثلاث. تظهر النتيجة أن أفضل أسلوب هو دقة C4.5 هو ٩٥.٦٪ والأسلوب الثاني هو K-أقرب جار مع دقة ٩٥.٤٪ والأسوأ هو MLP بدقة ٩٥.٣٪.

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