MOVING TOWARD LESS UNCERTAINTY SEISMIC RISK PREDICTION USING GRANULAR COMPUTING ALGORITHM

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ABSTRACT

Iran is one of the seismically active areas of the world due to its position in the Alpine-Himalayan mountain system. So, strong earthquakes in this area have caused a high toll of casualties and extensive damage over the last centuries.

Pre-determining locations and intensityof seismic area of a city is considered as a complicateddisaster management problem. As, this problem generally depends on various criteria, one of the most important challenges concerned is the existence of uncertainty regarding inconsistency in combining influencing criteria and extracting more consistent knowledge forthe next predictions. To overcome this problem, this paper proposes a new approach for seismic risk knowledge discovery based on granular computing theory. One of the significant properties of this method is inductionof more compatible rules having zero inconsistency fromexisting databases. Furthermore, in this approach non redundant covering rules will be extracted for consistent classification where one object maybe classified with two or more non-redundant rules.

In this paper, the seismic risk of the area between 58˚ 24' E, 60˚ 24' E Longitude and 27˚ 45' N, 29˚ 25' N Latitude around occurred near Reygan (Kerman Province), South-East of Iran where a devastating earthquake happened is considered as the study area. The result of this paper exhibits why granular computing is proposed to decrease the uncertainty of knowledge extracted from input large dataset.

INTRODUCTION

On December 26, 2003 when a major earthquake with magnitude 6.6 Mw hit the south-eastern of Iran, Kerman province, at 05:26AM (Iran standard time), the area most affected was the city of Bam where more than 43,000 people were killed, an estimated 30,000 injured and up to 75,000 left homeless, according to official estimates. Seven years after, another deadly earthquake struck its neararea. The epicentre of this