

**USE OF THE SUPPORT VECTOR MACHINES METHOD FOR GATE ROAD
CONVERGENCE PREDICTION**

Stanislaw Prusek

Central Mining Institute – Poland

The paper describes a trial to use the Support Vector Machines (SVM) method for calculation (prediction) of gate road convergence value. This method allows to solve regression and classification problems. The basis for mathematically-statistical analyses using the SVM method constituted the underground measurement results of deformation of gate roads maintained behind the caving longwall front. Satisfying prediction results giving bases to a wider SVM method application relating to gate road convergence prediction were obtained.

References

1. Biliński A.: Symptom of rock mass pressure in longwall extraction fields in coal seams (in Polish). Scientific Booklets of the Silesian Technical University, No. 221, 1968.
2. Doak J., An evaluation of feature selection methods and their application to computer security, Technical Report CSE-92-18, 1992.
3. Esterhuizen G.S., Barczak T.M.: Development of Ground Response Curves for Longwall Tailgate Support Design. Proceedings of the 41st U.S. Rock Mechanics Symposium, Golden, Colorado, June 17-21, 2006
4. Jacobi O.: Praxis der Gebirgsbeherrschung. Verlag Glückauf, Essen 1976 r.
5. Jacobi O: Die Gesetzmässigkeit zwischen Gebirgsdruck und Konvergenz in Abbaustrecken. Glückauf Nr. 23, 1973.
6. Junker M. and others: Gebirgsbeherrschung von Floezstrecken. Verlag Glückauf GmbH, Essen 2006.
7. Majcherczyk T., Małkowski P.: Impact of the longwall front on the size of the fracture zone around a gate road (in Polish). Wiadomości Górnicze nr 1, 2003r.
8. Prusek S.: Selected results of underground measurements of gate roads (in Polish). Przegląd Górniczy nr 11, 1999.
9. Prusek S: Aufrechterhalten einer Abbaubegleitstrecke im Bereich von zwei Bruchbaustrecken. Glückauf Nr. 10, 2003.
10. Prusek S. : Changes of cross-section surface of gate road when minig coal seams divided into slices (in Russian. Ugol Ukraine, no 6, 2004.
11. Prusek S, Lubosik Z.: Monitoring of a longwall gate road maintained behind the caving extraction front. Freiburger Forschungshefte C 519, Geoingenieurwesen, 2007.
12. Prusek S: Determination of dependences to gate road convergence prediction (in Polish). Scientific Works of GIG. Quarternary No III/2008
13. Prusek S.: Characteristic of gateroads deformation procesess caused by direct impact of caving longwall extraction. Research Project performed at GIG number 04010327-150
14. Vapnik V.N., The Nature of Statistical Learning Theory, Springer, 2000.
15. Witten I. H., Frank E: Data Mining: Practical machine learning tools and techniques, 2nd Edition, Morgan Kaufmann, 2005.
16. <http://www.statsoft.pl/dataminer2.html>
17. <http://www.statsoft.pl/products/mspcdetails.html>