

Bachelor thesis topic

Topic: Visualization for Predictive Modeling

Predictive modeling is used to predict the probability of an outcome for a process. For example, in medicine predictive modeling is utilized to diagnose diseases at the early-stages by using the case history of a patient. In industry, predictive modeling found a use in quality control of manufactured products. Your task will be to do a literature research and a report regarding predictive modeling and the visualization of predictive modeling results.

Keywords: visualization, visualization of fuzzy data, visualization of probabilistic data, machine learning, prediction, feature extraction, feature tracking, digital volume correlation

Questions:

- Which papers are dealing with predictive modelling?
- Which papers are dealing with visualization of probabilistic data?
- Which predictive models exist and which task do they solve.
- How visualization can supports in analysis of predictive modeling results?

Starting literature:

- H. R. Roth, C. T. Lee, H. C. Shin, A. Seff, L. Kim, J. Yao, L. Lu, and R. M. Summers, "Anatomy-specific classification of medical images using deep convolutional nets," in 2015 IEEE 12th International Symposium on Biomedical Imaging (ISBI), 2015, pp. 101–104.
- P. Bentley, J. Ganesalingam, A. L. Carlton Jones, K. Mahady, S. Epton, P. Rinne, P. Sharma, O. Halse, A. Mehta, and D. Rueckert, "Prediction of stroke thrombolysis outcome using CT brain machine learning," *NeuroImage: Clinical*, vol. 4, pp. 635–640, 2014.
- Tzeng, Fan-Yin, and Kwan-Liu Ma. "Intelligent Feature Extraction and Tracking for Visualizing Large-Scale 4D Flow Simulations." In *Supercomputing, 2005. Proceedings of the ACM/IEEE SC 2005 Conference*, 6–6, 2005. doi:10.1109/SC.2005.37.
- Pellegrini, P. D. Sanzo, and D. R. Avresky, "A Machine Learning-Based Framework for Building Application Failure Prediction Models," in *Parallel and Distributed Processing Symposium Workshop (IPDPSW), 2015 IEEE International*, 2015, pp. 1072–1081.
- H. C. Shin, M. R. Orton, D. J. Collins, S. J. Doran, and M. O. Leach, "Stacked Autoencoders for Unsupervised Feature Learning and Multiple Organ Detection in a Pilot Study Using 4D Patient Data," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 35, no. 8, pp. 1930–1943, Aug. 2013.

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