Challenges on Data Analytics for Risk Predictions based on Deep and Ensemble Learning

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Discovering patterns from big data attracts a lot of attention due to its importance in discovering accurate patterns and features that are used in predictions of decision making.

The challenges in big data are the high dimensionality and complexity in data representation and analytics especially for on-line feature selection. Granular computing and feature selection on data streams are among the challenge to deal with big data analytics that is used for Decision making. We will discuss these challenges in this talk and provide new projection on ensemble and deep learning techniques for on-line health care risk prediction. Different type of data (time series, linguistic values, interval data, etc.) imposes some difficulties to data analytics due to preprocessing and normalization processes which are expensive and difficult when data sets are raw, or imbalanced. I will highlight these issues through project applied to health-care for elderly, by merging heterogeneous metrics from multi-sensing environment for providing health care predictions and assisting elderly for active aging services. I have utilized ensemble learning as multi-classification techniques on multi-data streams using incremental learning to update data change "concept drift".

Subjectivity (i.e., service personalization) would be examined based on correlations between different contextual structures that are reflecting the framework of personal context, for example in nearest neighbor based correlation analysis fashion or employing Convolutional Neural Network for

classification and feature selection for unstructured data. I present deep learning feature selection in medical application for early predictions (heart diseases and others) with high accuracy and specifity using real data. I present some result on Virtual Doctor Systems, and highlights its innovation in interactions with elderly patients in real time. Then I will discuss many challenges in machine learning of multiclass classification and decision support systems research domains. In this talk I will present the current state of art and focus on health care risk analysis applications with examples from our team research experiments.

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He is professor at Iwate Prefectural University (IPU), Iwate, Japan, as a director of Intelligent Software Systems. He is the Editor-in-Chief of Knowledge-Based Systems, Elsevier of impact factor (4.528) for 2016. He received Doctor Honoris Causa from Óbuda University in 2013, and a title of Honorary Professor from Óbuda University, Budapest, Hungary in 2011. He received honorary scholar award from University of Technology Sydney, Australia on 2012. He is Adjunct professor to Stockholm University, Sweden, University of Technology Sydney, National Taiwan Ocean University and others. He has supervised PhD students jointly with University of Laval, Quebec, Canada; University of Technology, Sydney, Australia; Oregon State University (Corvallis), University of Paris 1 Pantheon-Sorbonne, France and University of Genoa, Italy. He has four international Patents in Software System and Several research projects with Japanese industry and partners. He is vice president of International Society of Applied Intelligence, and Co-Editor in Chief of Applied Intelligence Journal, (Springer). He has given many keynotes in many prestigious international conferences on intelligent system and subjective intelligence. He headed a number of projects including Intelligent HCI, a project related to Mental Cloning as an intelligent user interface between human user and computers and SCOPE project on Virtual Doctor Systems for medical applications.