

Open Data Science Conference 2019 West

<https://odsc.com/training/portfolio/interpretable-knowledge-discovery-reinforced-by-visual-methods/>

Interpretable Knowledge Discovery Reinforced by Visual Methods

Abstract: This tutorial will cover the state-of-the-art research, development, and applications in the KDD area of interpretable knowledge discovery reinforced by visual methods to stimulate and facilitate future work. It will serve the KDD mission of gaining insight from data. The topic is interdisciplinary bridging scientific research and applied communities in KDD, Visual Analytics, Information Visualization, and HCI. This is a novel and fast growing area with significant applications, and potential.

First, in KDD, these studies have grown under the name of visual data mining. The recent growth under the names of deep visualization, and visual knowledge discovery, is motivated considerably by deep learning success in accuracy of prediction and its failure in explanation of produced models without special interpretation efforts. In the areas of Visual Analytics, Information Visualization, and HCI, the increasing trend toward machine learning tasks, including deep learning, is also evident.

This tutorial will review progress in these areas with a comparative analysis of what each area brings to the joint table. The comparison will include the approaches: (1) to visualize Machine Learning (ML) models produced by the analytical ML methods, (2) to discover ML models by visual means, (3) to explain deep and other ML models by visual means, (4) to discover visual ML models assisted by analytical ML algorithms, (5) to discover an analytical ML model assisted by visual means. The presenter will use multiple relevant publications including his books: "Visual Knowledge Discovery and Machine Learning" and "Visual and Spatial Analysis: Advances in Visual Data Mining, Reasoning, and Problem Solving" published in Springer.

The target audience of this tutorial consists of KDD researches, graduate students, and practitioners with the basic knowledge of KDD, data mining, and machine learning. The necessary information on the visualization and visual analytics methods will be provided.

Bio: Dr. Boris Kovalerchuk is a professor of Computer Science at Central Washington University, USA. His publications include three books "Data Mining in Finance " (Springer, 2000), "Visual and Spatial Analysis" (Springer, 2005), and "Visual Knowledge Discovery and Machine Learning" (Springer, 2018), a chapter in the Data Mining Handbook and over 170 other publications. His research interests are in data mining, machine learning, visual analytics, uncertainty modeling, data fusion, relationships between probability theory and fuzzy logic, image and signal processing. Dr. Kovalerchuk has been a principal investigator of research projects in these areas supported by the US Government agencies. He served as a senior visiting scientist at the US Air Force Research Laboratory and as a member of expert panels at the international conferences and panels organized by the US Government bodies.

Speaker



Boris Kovalerchuk, PhD

Title / Company

Professor | Central Washington University

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