Foundations of Machine Learning and Predictive Modeling for the Non-expert

Online Tutorial at ICWSM 2022

- **Tutorial description:**

This tutorial covers the fundamental concepts of machine learning including methods and algorithms for predictive modeling and data driven analysis (k nearest neighbors, k-means clustering, tree-based models, generalized linear model, gradient descent, artificial neural networks, deep learning, principal component analysis, singular value decomposition). The content is designed for the diverse audience of ICWSM and particularly those without a computer science background. Computer or programming background is not needed, but an interactive tutorial on basic Python will be sent to the participants before the workshop so that we can start on an equal footing. No software installation will be needed. Coding will be done on Google Colab https://colab.research.google.com/

The aim of the tutorial is to provide participants with an engaging and interactive experience to learn the fundamentals of machine learning in a jargon-free class to gain critical skills which have started to become increasingly relevant to the predictive analysis of social media data. The tutorial is structured with three 50-minute modules.

- **Organizer:**

Samin Aref
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https://saref.github.io/

- **Interaction style:**

The proposed format is natively virtual given the experience of successful tutorials at other online and hybrid conferences. Preparatory material will be sent to participants in advance so that everyone can start on equal footing for any hands-on activities. A range of teaching methods will be used to ensure that all learning objectives are met despite attendees coming from different fields.

- **Date, time, and location:**

6 June 2022, 10:00-13:00 EST, online (link for the online platform will be shared with participants in advance.)

- **Tutorial schedule and activities:**

    - Module 1: Methods and concepts for instance-based learning (50 minutes)
    - Break 1
    - Module 2: Projections and data transformation methods (50 minutes)
    - Break 2
    - Module 3: Methods and concepts for model-based learning (50 minutes)

- **Target audience, prerequisites, and outcomes:**

This tutorial “translates” computational concepts to researchers from fields other than computer science and is therefore more beneficial to a non-expert audience. The content is designed for the diverse audience of ICWSM and particularly those without a computer science background. The intended audience are researchers who plan to start using machine learning in their work or gain basic skills for understanding and interpreting others’ works which involve machine learning components.

Computer or programming background is not needed. Preparatory material will be sent to participants in advance so that everyone can start on equal footing for any hands-on activities.

The aim of the tutorial is to provide participants with an engaging and interactive experience to learn the fundamentals of machine learning in a jargon-free class to gain critical skills which have started to become increasingly relevant to the predictive analysis of social media data.

- **Materials:**

All tutorial materials will be shared with the participants in advance.