"THE INTRODUCTION OF MODELS FOR PREDICTIVE RISK STRATIFICATION IN CLINICAL PERSONALIZED DECISION MAKING. THE CLICAL AND RSF-CLICAL ALGORITHMS"

Speakers:
Giuseppe Masucci, M.D., Assoc. Prof. Dept of Oncology-Pathology, and KcRN Karolinska Institutet
Cancer Centrum Karolinska (CCK) Karolinska University Hospital - Stockholm - Sweden
Simão Neto, Felipe Aristides Scientific Project Manager at Geneva Technologies Oy • Tampere, Finland

ABSTRACT

SRF-CLICAL: AN APPROACH FOR PATIENT RISK STRATIFICATION USING RANDOM FOREST MODELS

• OVER RECENT YEARS, MACHINE LEARNING METHODS HAVE BEEN SUCCESSFULLY EMPLOYED IN A WIDE RANGE OF SETTINGS INVOLVING HIGHLY COMPLEX, HETEROGENEOUS DATA SOURCES. DESPITE THESE TECHNOLOGICAL ADVANCES, MOST OF THE CURRENTLY USED METHODS FOR CLINICAL RISK PREDICTION ARE STILL BASED ON SIMPLER REGRESSION APPROACHES WHICH ONLY HANDLE A SMALL NUMBER OF PREDICTIVE VARIABLES. THE AIM OF THIS STUDY WAS TO DEVELOP AN EASY TO USE, FLEXIBLE, CLINICAL RISK PREDICTION METHOD THAT CAN BE APPLIED TO ANY DISEASE FOR WHICH SIGNIFICANT AMOUNTS OF CLINICAL, BIOMARKER AND/OR GENOMIC DATA IS AVAILABLE. SRF-CLICAL BUILDS UPON AND IMPROVES THE PERFORMANCE OF THE ORIGINAL EMPIRICAL CLINICAL CATEGORIZATION ALGORITHM (CLICAL) [4, 5], WHILE ALSO MAKING THE METHODOLOGY MORE GENERALLY APPLICABLE. AS A PROOF OF CONCEPT, WE DEMONSTRATE THE SUITABILITY OF RFS-CLICAL TO PRODUCE A CLINICAL RISK PREDICTION MODEL FOR METASTATIC MELANOMA BASED ON CLINICAL DATA FROM A COHORT OF 578 PATIENTS FOR WHICH 8 CLINICAL VARIABLES WERE AVAILABLE. FURTHER VALIDATION WAS DONE USING AN EXTERNAL COHORT OF 18 METASTATIC MELANOMA PATIENTS [6], AND THE GENERALISABILITY OF THE APPROACH WAS DEMONSTRATED ON A COHORT OF 580 COLORECTAL CANCER PATIENTS.

ON LINE SEMINAR
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UNIT OF BIOSTATISTICS, EPIDEMIOLOGY AND PUBLIC HEALTH
DEPARTMENT OF CARDIAC, THORACIC, VASCULAR SCIENCES AND PUBLIC HEALTH
UNIVERSITY OF PADOVA

REFERENTE: SEGRETERIA DI UNITÀ
SEDE DI VIA L. LOREDAN, 18, 35131 PADOVA
TEL. 049 8275407, TEL. 049 8275382