



MACRO/POLICY CLUSTER

Machine Learning: Knowledge Discovery and Best Practices

PROJECT 06-05161.GIT

Value Proposition:

- Develop an optimized classification model for prediction of treatment outcomes and identification of best practice characteristics
- Design optimized evidence-based treatment plans and dissemination of this knowledge and best practice transfer across multiple sites
- Improve quality and efficiency of care across patient populations with reduced waste, maximized financial performance, decreased practice variability

Description:

Advances in machine learning techniques offer reliable means to extract useful information from large-scale, high-dimensional datasets. Electronic medical records (EMRs) have been widely adopted across providers within the healthcare industry, opening opportunities for exploratory analysis based on patient diagnosis and treatment history. The project focuses on practice patterns across hundreds of care sites. Using machine learning techniques, we build classification models to predict patient treatment outcome based on features extracted from the EMR. We then identify critical variables that affect treatment outcome and best practice characteristics. Using this information, evidence-based treatment plans will be designed and optimize site performance and disseminate results for knowledge and best practice transfer. This increases quality and timeliness of care, maximizes financial performance, and decreases practice variability across the organizations.

How this is different than related research:

Although adoption of EMR is spreading, many providers continue to document clinical findings, procedures and outcomes with “free text” natural language on their EMRs. Clinical terminology have standardized terms and are essential to facilitating interoperability between medical systems by the seamless sharing and exchange of healthcare information. This study establishes interoperability among EMRs from 737 providers (with 2.7 million patients) by developing a system that can accurately map free text to concise structured medical concepts. These standardized terms can be used to improve classification models for outcome prediction, discovery and dissemination of optimized treatment plans.



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