

Individuals and Organizations Completing Research in the IMEDS Lab  
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**Research Objectives and Aims:** In earlier work with OMOP the Auburn team had panels of experts review cases selected using existing HOI definitions. The objectives of the current study are to use machine learning techniques on training datasets created for acute kidney injury, acute liver injury, and myocardial infarction.

**Scope/Proposed Approach:** We previously used medical panels working with state-of-the-art dashboards to construct data sets of cases, controls, and false positive cases (controls that look very similar to cases) for acute myocardial infarction, liver failure, and kidney failure. In collaboration with the Page team at the University of Wisconsin, we will use the leading machine learning (ML) algorithms, including random forests, support vector machines, logistic regression, and continuous time Bayes nets, to construct models to distinguish cases from controls (including false positive cases); we will estimate model accuracies (including area under the ROC curve and mean precision) by leave-one-out cross-validation, and will test whether one ML algorithm provides significantly higher model accuracies than the other algorithms.

**Impact:** Application of machine learning algorithms could help create improved health outcome case definitions which are important to drug safety surveillance with observational data.

**Experience:** Richard Hansen, PhD, Professor of Health Outcomes Research and Policy, and Peng Zeng, Associate Professor of Statistics are requesting access to the lab to work on existing datasets that were derived from the MSLR data.

**Timeline:** Anticipated 1 year of access will be needed, starting April 1, 2014.