



PROJECT TITLE: HIE Project for Chronic Disease and Workflow Management

PROPOSAL NUMBER: Tech1 | PI: Mastrangelo, Weech-Maldonado, Borkowski, Agarwal

RESEARCH THEME: Analytics & Innovative Technologies

BUDGET: \$150,000 | MULTI-UNIVERSITY PROJECT: YES | PROJECT YEAR: 1

DESCRIPTION:

There is a need in the healthcare industry to unify disparate sources of patient data to provide better care at lower costs. The integration of administrative, clinical, environmental and personal data sources is an opportunity to reconcile patients across all of their data records and the failure to do so can impede interoperability, leading to patient safety risks, revenue loss and decreased provider efficiency. The goal of this project is to explore the opportunities and challenges of integrated patient health data by characterizing the data, identifying the issues, determining relevant algorithms and models and applying the algorithms and models to healthcare delivery. The aims of this project are to apply this knowledge to three areas: 1) understanding the effects of integrated patient health data on workflows, 2) developing an architecture for a chronic care management system and 3) predicting re-admissions for a chronic disease.

HOW THIS IS DIFFERENT THAN RELATED RESEARCH:

This project is novel for using machine learning methods in new healthcare applications and using the resulting analytics for visual, patient-centered information to support meaningful and actionable decisions regarding chronic condition and potential hospital re-admission.

EXPERIMENTAL PLAN:

- Conducting literature and market search.
- Identify preliminary workflows.
- Identify and obtain data sources.
- Develop methods to complete definition (feature engineering) and construction of models.
- Develop and implement ML algorithms and decision support rules.
- Evaluate the models and metrics and integrate.

EXPECTED MILESTONES:

- 8/31/ 2018 Literature and market research
- 5/31/2018 Conceptual Modeling
- 7/31/2018 Construction of datasets
- 11/31/2018 Implementation of algorithms
- 2/28/2019 Evaluation of the models and metrics
- 4/30/2019 Integration

BENEFITS TO INDUSTRY:

Looking at healthcare delivery workflows from the perspective of integrated data analytics and visualization will result in the development of procedures to improve patient flow, to provide timely treatment of chronic conditions, to maximize utilization of available resources and reduce re-admissions.

EXPECTED DELIVERABLES:

A system architecture, a working prototype, a white paper on integration, a journal paper on using ML in workflow analysis.