Center for Discovery Science and Health Informatics (DSHI)

Director: Janusz Wojtusiak, PhD

Key Interests

Health Data | Artificial Intelligence | Data Mining | Machine Learning | Data Analytics | Complex Data Modeling | Research Support

CONTACT

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CAPABILITIES & EQUIPMENT

› Secure, HIPAA compliant data storage and infrastructure

› Health data expertise

SELECT PUBLICATIONS

- M. Zare *et al.*, Prediction of Patients' Mortality during Hospitalizations. *Journal of Soft Computing and Decision Support Systems* 5, 26-32 (2018).

- J. Wojtusiak *et al.*, C-LACE2: computational risk assessment tool for 30-day post hospital discharge mortality. *Health and Technology, Springer*, In Press Online (2018).

- H. Min *et al.*, Predicting activities of daily living for cancer patients using an ontology-guided machine learning methodology. *J Biomed Semantics* 8(1), 39 (2017).

- H. Min *et al.*, A Comprehensive Multimorbidity Index for Predicting Mortality in Intensive Care Unit Patients. *Journal of Palliative Medicine* 20(1), 35-41 (2017).

Research Focus

The mission of the Center for Discovery Science and Health Informatics (DSHI) is two-fold: to research computational methods to improve healthcare and to provide healthcare data processing and storage services to collaborators. The research is centered on machine learning, artificial intelligence, and computational approaches for the interpretation of complex health data. The processed data can then be used to inform decision making and fuel new discoveries. The Center supports a variety of health system stakeholders and end-users (clinicians, managers, researchers, policy makers, and consumers) from all sectors of the health system. They provide health data analysis and data storage services in a secure environment.

DSHI uses machine learning and intelligent systems to perform multidimensional modeling of complex healthcare data. The conclusions that they draw impact healthcare cost, quality, safety, and effectiveness.

DSHI conducts topical health research and provides support to other health researchers.

- The wandering patterns of people with dementia are collected using GPS trackers and analyzed with machine learning algorithms. The method can predict typical and atypical locations to support the search for missing people with dementia as well as track the progression of the disease.

- Realistic, synthetic patient data is generated using patterns in real data found by machine learning models. These data are useful for applications like student training or software testing, since real health data are protected and require approval to access.

- Automated assessment and prediction of the functional status of elderly patients has been developed. Using machine learning methods to analyze a patient's clinical notes and history, the patient's functional status can be predicted with high accuracy. This system is intended to inform patients, caregivers and families to assess and provide better care.

- Health data is hosted from the Mason and Partners (MAP) clinics and several collaborative research projects.