

# IEEE JOURNAL OF BIOMEDICAL AND HEALTH INFORMATICS

## J-BHI Special Issue on “Predictive Intelligence in Biomedical and Health Informatics”

Big and complex data is fueling diverse research directions in medical image analysis and computer vision, which can be divided into two main categories: (1) analytical methods, and (2) predictive methods. While analytical methods aim to efficiently analyze, represent and interpret data (static or longitudinal), predictive methods leverage the data currently available to predict observations at later time-points or to predict values for the missing data (i.e., for imputation). For instance, a method which only focuses on classifying patients with mild cognitive impairment (MCI) and patients with Alzheimer’s Disease (AD) is an analytical method, while a method that predicts if a subject diagnosed with MCI will remain stable or convert to AD over time is a predictive method. It would constitute a stunning progress in the biomedical data analysis and health informatics research community if, in a few years, we contribute to engineering ‘predictive intelligence’ methods, which can map both low- and high-dimensional biomedical data onto the future scores with high precision. Despite the terrific progress that analytical methods have made in the last twenty years in medical image segmentation, registration or other related applications, efficient predictive intelligent models are somewhat lagging behind. As such predictive intelligence develops and improves—and this is likely to do so exponentially in the coming years—this will have far-reaching consequences for the development of new treatment procedures and novel tools in health informatics.

The goal of this Special Issue is to publish original manuscripts and the latest research advancements in different aspects of biomedical, health informatics, and medical image analysis, where predictive methods in artificial intelligence and computer vision intersect with healthcare and life sciences. This Special Issue also provides an opportunity to propel the advent of predictive models in a broad sense, with application to biomedical data. Manuscripts describing new cutting-edge machine learning and deep learning methods that solve challenging problems in the biomedical and health informatics fields are the main focus of the Special Issue.

Topics of interest include but are not limited to:

- Leveraging health informatics methods for predicting disease development through time from a limited number of observations;
- Computer-aided prognostic methods (e.g., for brain diseases, prostate cancer, cervical cancer, dementia, acute disease, neurodevelopmental disorders);
- Forecasting disease or cancer progression over time;
- Predicting low-dimensional biomedical data (e.g., behavioral scores, clinical outcome, age, gender) from natural, biomedical and/or neuro-images;
- Predicting high-resolution medical images from low-resolution images;
- Biomedical data synthesis: predicting biomedical image modalities from other modalities;
- Predicting lesion evolution;
- Big data analytics for predicting missing data (e.g., data imputation or data completion);
- Predicting clinical outcome from biomedical data (genomic, imaging data, etc.).

### Guest Editors

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### Key Dates

Deadline for Submission: 31 January, 2019

First Reviews Due: 30 March, 2019

Revised Manuscript Due: 30 May, 2019

Final Decision: 20 June, 2019