2014-592 3D POPULATION MAPS FOR NONINVASIVELY IDENTIFYING PHENOTYPES AND PATHOLOGIES IN INDIVIDUAL PATIENTS

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Technology description

SUMMARY
UCLA researchers in the Department of Radiological Sciences have developed a novel computation system that uses large imaging datasets to aid in clinical diagnosis and prognosis.
BACKGROUND
Population and subpopulation images can be used as a diagnostic guide to search for abnormalities, especially ones that are difficult to detect, and the probabilities based on these population maps may also guide procedures such as biopsies to maximize removal of diseased tissue. Many studies have examined image features between various populations and have created population maps to visualize and draw comparisons between patients. However, the accuracy of predicting pathologies for a single patient given a large dataset of patients has not be achieved. This type of system could aid the prediction of treatment response, phenotypes, and outcomes in individual patients.
INNOVATION
UCLA researchers led by Dr. Dieter Enzmann have developed a novel inference system that enables the use of large databases of image lesions, pathology locations, and other image features to provide clinical prediction of patient prognosis, phenotypes, and early detection of abnormal pathologies. Physiological or anatomical images (i.e. MRI, PET, CT, ultrasound, etc.) from large databases, such as clinical picture archiving and communication systems (PACS) and Alzheimer’s disease neuroimaging initiative (ADNI) databases, can be used. This innovative inference system can use an individual patient’s imaging data to provide information regarding a predicted diagnosis, identification of a pathology, lesions or areas of interest, as well as the uncertainty in its prediction.

Application area

Clinical inference system
Prediction device that assesses a patient’s prognosis and response to a particular therapy
Tool to identify location and presence of lesions or abnormal pathology

Advantages

System uses clinical databases to predict abnormal pathologies and patient prognosis
Large databases can be used (PACS and ADNI)
Uses many types of radiological images (MRI, PET, CT, ultrasound)
Provides uncertainty in the system’ s prediction

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