AN APPROACH ON MULTI TASK LEARNING OF MENTAL HEALTH USING SOCIAL MEDIA TEXT

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ABSTRACT:
High prevalence of mental illness and the need for effective mental health care, combined with recent advances in AI, has led to an increase in explorations of how the field of machine learning (ML) can assist in the detection, diagnosis and treatment of mental health problems. ML techniques can potentially offer new routes for learning patterns of human behavior; identifying mental health symptoms and risk factors; developing predictions about disease progression; and personalizing and optimizing therapies. Three formulations of MTL are compared: i) Multi-task Multi-Kernel learning, which feeds information across tasks through kernel weights on feature types, ii) a Hierarchical Bayes model in which tasks share a common Dirichlet prior, and iii) Deep Neural Networks, which share several hidden layers but have final layers unique to each task. We show that by using MTL to leverage data from across the population while still customizing a model for each person, we can account for individual differences, and obtain state-of-the-art performance on this dataset. We model the different conditions as tasks in a multitask learning (MTL) framework, and establish for the first time the potential of deep learning in the prediction of mental health from online user-generated text.