

# Longitudinal DepDetector

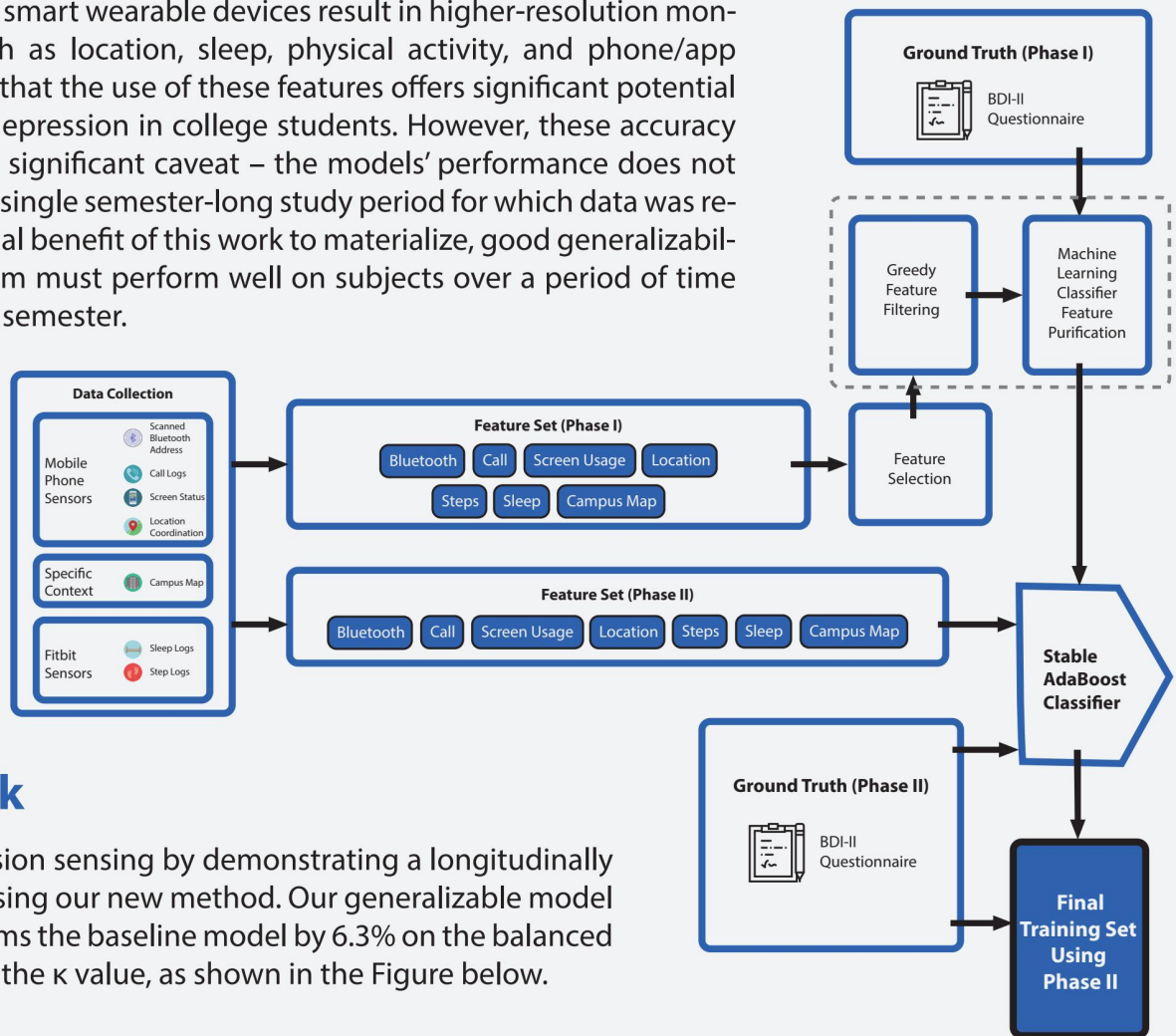
## Modeling Wellness using Smartphone and Activity Data

Ather **Sharif** Galen **Weld** Xuhai **Xu**

The Paul G. Allen School of Computer Science & Engineering  
University of Washington

### Motivation

Amongst college students, rates of self-reported mental health concerns are increasing across the vast majority of universities in the United States. The ubiquity of smartphones and smart wearable devices result in higher-resolution monitoring of activity such as location, sleep, physical activity, and phone/app usage. Past work finds that the use of these features offers significant potential to accurately predict depression in college students. However, these accuracy numbers suffer from a significant caveat – the models' performance does not generalize beyond the single semester-long study period for which data was recorded. For the potential benefit of this work to materialize, good generalizability is critical, as a system must perform well on subjects over a period of time longer than a 16-week semester.



### Research Work

We advance in depression sensing by demonstrating a longitudinally generalizable model using our new method. Our generalizable model significantly outperforms the baseline model by 6.3% on the balanced accuracy and 0.121 on the  $\kappa$  value, as shown in the Figure below.

