

Title: Internet of High-throughput Phenotypers (IoHTP)

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Abstract:

The rise of high-throughput phenotyping (HTP) has led to a dramatic increase in the ability to rapidly – and accurately – phenotype various organisms including plants. However, methods for efficiently managing, processing, analyzing, and sharing HTP data have not caught up to this new-found ability to collect big data which in turn introduces a whole host of new challenges. To address these, we have architected and implemented a multi-faceted infrastructure of web-services to further unify and automate the entire data collection process. We have integrated CyVerse and Slack into our IoHTP, two commonly used tools within plant science labs. CyVerse is a cloud-based data storage & management solution and Slack allows for bilateral instant-message communication with the HTP machines to keep researchers in touch with their autonomous experiments. Next, we are also developing our own website for administering jobs remotely to any number of (possibly geographically distributed) HTP machines. This innovative open-source approach has the potential to further advance high-throughput phenotyping worldwide by allowing interdisciplinary experts, namely in the plant and computer sciences, to collaborate more effectively and efficiently.