

Phenotyping, computer vision and sensing - a match made in heaven

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Abstract

An increasing population and climate change put pressure on several societally important issues. Health costs are increasing and at the same time feeding the world becomes a challenge. Imaging (and sensing) is central to furthering our understanding of biology not only in its diagnostic capacity but also in phenotyping variation. When decoupling sensing from analysis interesting approaches to phenotyping emerge.

As an example, I will present our affordable plant phenotyping platform <http://phenotiki.com>. I will discuss (and present solutions) to application-aware compression (necessary to reduce bandwidth), and machine learning solutions for trait extraction. I will use a multi-instance counting problem amidst nuisance of scale and rotation changes to discuss issues of invariance and present a shallow Restricted Boltzmann Machine that achieves explicit rotation invariance.

Finally, I will highlight interesting computer vision problems that arise in plant phenotyping and conclude by presenting our efforts (open data, competitions, collation studies and workshops), to help attract vision experts in this, critical for the sustainability of our planet, domain.

All welcome!