

Bachelor/Masters project:

What do plant roots know about the physics of granular media?

Scientific question:

Approximately 500 millions years ago plants started colonizing the earth outside the oceans. To do so they had to learn how to anchor themselves in the soil while at the same time extract water and nutrients from it. Now soil consists of individual particles, it is one instance of what is called granular media. And granular media have some rather peculiar mechanical properties such as for example *dilatancy*: above a certain density granular media will expand when sheared. The open question is how much granular physics (and what exactly) have roots “learned” during the course of their evolution?

The experiment:

We grow mustard seeds and chick peas in special growth containers filled with an artificial soil of plastic spheres. In regular intervals we scan the soil using X-ray tomography and analyze how the root growth depends on parameters like the local packing density.

What will you learn:

Building an automatized green house. Performing X-ray tomography and analyzing the results using Matlab.

Whom are we looking for:

You are curious and self-motivated. Having a green thumb will make things easier. Ideally, you have some previous experience in computer programming (it does not matter in which language).

Contact:

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