

Tan Bao

Doctor of Philosophy

Department of Biological Sciences,
Faculty of Science

Image created in the Growth
Chambers on the Fifth Floor of the
Biological Sciences Building,
University of Alberta

Roots and Shoot

Semi-Finalist

This image is a composite image of two photos of the same sunflower (*Helianthus annuus*) plant. The aboveground green shoot was taken with a Nikon D90 SLR, and on the same day the belowground root was scanned using an Epson 550 Scanner after removing the soil by excavation. By stitching together the root and shoot image, we are able to see the hidden complexity of this little plant that is buried in the soil. Roots are important for plants for acquiring water and nutrients and keeping the plant upright, but are hard to study in nature because they are always obscured by soil. Our research has focused on developing a protocol to apply Digital Image Correlation (DIC) methods to visualizing and characterizing these hidden plant roots. We are now using these new protocols to understand how plants make decisions about where to place roots given choices of nutrient rich and poor patches under stressful conditions.