



# Evaluation of 3D/2D Imaging and Image Processing Techniques for the Monitoring of Seed Imbibition

Submitted by Etienne Belin on Thu, 06/21/2018 - 14:16

Titre	Evaluation of 3D/2D Imaging and Image Processing Techniques for the Monitoring of Seed Imbibition
Type de publication	Article de revue
Auteur	Belin, Etienne [1], Gillard, Nicolas [2], Douarre, Clément [3], Franconi, Florence [4], Rojas Varela, Julio [5], Chapeau-Blondeau, François [6], Demilly, Didier [7], Adrien, Jérôme [8], Maire, Eric [9], Rousseau, David [10]
Pays	Suisse
Editeur	MDPI
Type	Article scientifique dans une revue à comité de lecture
Année	2018
Langue	Anglais
Date	2018
Numéro	7
Pagination	83,1-16
Volume	4
Section	83
Titre de la revue	Journal of Imaging
ISSN	2313-433X
Mots-clés	imaging techniques [11], MRI; thermography [12], seed imbibition [13], speckle imaging [14], X-ray tomography [15]
Résumé en anglais	<p>Seed imbibition is a very important process in plant biology by which, thanks to a simple water income, a dry seed may turn into a developing organism. In natural conditions, this process occurs in the soil, e.g., with difficult access for a direct observation. Monitoring the seed imbibition with non-invasive imaging techniques is therefore an important and possibly challenging task if one tries to perform it in natural conditions. In this report, we describe a set of four different imaging techniques that enable to addressing this task either in 3D or in 2D. For each technique, the following items are proposed. A detailed experimental protocol is provided to acquire images of the imbibition process. With the illustration of real data, the significance of the physical quantities measured in terms of their relation to the income of water in the seed is presented. Complete image analysis pipelines are then proposed to extract dynamic information on the imbibition process from such monitoring experiments. A final discussion compares the advantages and current limitations of each technique in addition to elements concerning the associated throughput and cost. These are criteria especially relevant in the field of plant phenotyping where large populations of plants are imaged to produce quantitatively significative traits after image processing</p>
URL de la notice	<a href="http://okina.univ-angers.fr/publications/ua17133">http://okina.univ-angers.fr/publications/ua17133</a> [16]

DOI 10.3390/jimaging4070083 [17]  
Lien vers le document <http://www.mdpi.com/2313-433X/4/7/83> [18]

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### **Liens**

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- [17] <http://dx.doi.org/10.3390/jimaging4070083>
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Publié sur *Okina* (<http://okina.univ-angers.fr>)