

Algorithm for Plant Growth Measurement Using RGM and VGM

S. Chuai-Aree¹, S. Siripant², W. Jäger³, and H. G. Bock⁴

Abstract: Plant growth measurement is very important to obtain the growth function. Different plants have different growths properties in their life cycle. To investigate the growth function, image processing is applied to measure growth properties from automatic captured image sequence in experiments. This paper proposes an algorithm to measure the plant growth function using image processing. Algorithms so-called region growing method (RGM) and volume growing method (VGM) are used for plant leaf segmentation and noise removal. The overlapped leaves are considered during the computation of growth measurement. The software is implemented using Delphi/Pascal programming for graphical user interface and OpenGL library for 3D graphic visualization. The growth function based on logistic model is obtained after computing process using Levenberg-Marquardt algorithm. The computed results from algorithm are satisfied. This algorithm can be applied for other plant growth measurements.

¹ Department of Mathematics and Computer Science
Faculty of Science and Technology, Prince of Songkla University
181 Charoenpradit Road, Rusamilae District, Muang, Pattani 94000, Thailand
csomporn@bunga.pn.psu.ac.th

² Advanced Virtual and Intelligent Computing (AVIC)
Faculty of Science, Chulalongkorn University
Phayathai Road, Phatumwan, Bangkok 13300, Thailand
ssuchada@chula.ac.th

^{3, 4} Interdisciplinary Center for Scientific Computing
University of Heidelberg
Im Neuenheimer Feld 368, 69120 Heidelberg, Germany
{jaeger, bock}@iwr.uni-heidelberg.de