

Paddock location information as an adjunct to satellite data when using machine learning for crop recognition

Robyn R Gibson and Mike Cameron-Jones

*School of Computing
University of Tasmania
e-mail: R.Gibson@utas.edu.au*

Abstract. Collecting information about crops by on-ground inspection is difficult, expensive, and time consuming. Satellite images have the potential to provide this information. This paper reports on an investigation into the application of machine learning techniques to crop classification from satellite images in selected agricultural regions of Tasmania. Information available about the location of pixels within the paddocks in the image was used to try to improve the accuracy of classification. Even casual observation of crops growing in paddocks suggests that they are often not uniform over the whole of the paddock, in particular the edges of the paddock are often different from the inside of the paddock. This lack of uniformity will produce `noisy` data that will make the task of accurate classification considerably more difficult. Several supervised classifier learning techniques from the field of machine learning were used to build classifiers from data of paddocks in one area for a growing season. The performance of these classifiers was tested on other paddocks in the same area and growing rseason. Three methods of using the available paddock information to reduce the noisiness of the data were investigated. These methods were • Excluding pixels that were on the boundaries of paddocks. • Voting among pixels in a paddock after classification. • Summarising the band data for all the pixels in a paddock Excluding pixels on the boundaries of paddocks and voting after classification improved the performance accuracy of classification of crops, summarising data before the learning phase of classification did not.