Title:
MCV: A (semi-)hierarchical image labelling technique utilising MRF image models

by
Dr. John Mashford
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Room NA 1.418, GTP building (Ground Floor),
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Abstract
In this talk the MCV (Markov concurrent vision) image labeling algorithm is described. This algorithm is a (semi-) hierarchical algorithm commencing with a partition made up of single pixel regions and merging regions or subsets of regions using a Markov random field (MRF) image model. It is an example of a general approach to computer vision called concurrent vision in which the operations of image segmentation and image classification are carried out concurrently. The output of the MCV algorithm can be a simple segmentation partition or a sequence of partitions which can provide useful information to higher level vision systems. In the case of an autoregressive Gaussian MRF the evaluation of sub-images for homogeneity is computationally inexpensive and may be effected by a hardwired feed-forward neural network. The merge operation of the algorithm is massively parallelizable.

Biography:
John Mashford studied Mathematics, Physics and Philosophy at Melbourne University between 1975 and 1979 where obtained a BSc.(Hons.) degree. In 1980 he worked for the engineering company Nelson English, Loxton and Andrews. Between 1981 and 1984 he studied Mathematics at the State University of New York at Stony brook concentrating on Differential Geometry and Analysis (with a 7 month break living in Paris). He commenced working for CSIRO full time in July, 1985. He completed his PhD on mathematical physics part time at Melbourne University, while working full time for CSIRO, between 1992 and 2005. He ceased working for CSIRO full time in November 2014 and is currently a consultant mathematician. He has programmed in FORTRAN, C, C++, Lisp, PROLOG and Java and is familiar with the DOS, Windows and UNIX operating systems. His CSIRO research has been in the areas of operations research, artificial intelligence and mathematical modelling concentrating specifically on computer vision. He has published more than 40 papers and is a member of IEEE and ACM. He invented and implemented a method for rail route optimisation which resulted in a multimillion dollar CSIRO spinoff company and was awarded the Australian Technology Award, and also the MCV image labelling algorithm which is currently being run on CSIRO supercomputers for remote sensing applications.