PixelLearn

PixelLearn is an integrated user-interface computer program for classifying pixels in scientific images. Heretofore, training a machine-learning algorithm to classify pixels in images has been tedious and difficult. PixelLearn provides a graphical user interface that makes it faster and more intuitive, leading to more interactive exploration of image data sets. PixelLearn also provides image-enhancement controls to make it easier to see subtle details in images. PixelLearn opens images or sets of images in a variety of common scientific file formats and enables the user to interact with several supervised or unsupervised machine-learning pixel-classifying algorithms while the user continues to browse through the images. The machine-learning algorithms in PixelLearn use advanced clustering and classification methods that enable accuracy much higher than is achievable by most other software previously available for this purpose. PixelLearn is written in portable C++ and runs natively on computers running Linux, Windows, or Mac OS X.

The program was written by Dominic Mazzoni, Kiri Wagstaff, Benjamin Bornstein, Nghia Tang, and Joseph Roden of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

This software is available for commercial licensing. Please contact Karina Edmonds of the California Institute of Technology at (818) 393-2827. Refer to NPO-41115.

Generating a 2D Representation of a Complex Data Structure

A computer program, designed to assist in the development and debugging of other software, generates a two-dimensional (2D) representation of a possibly complex n-dimensional (where n is an integer greater than or equal to 2) data structure or abstract rank-n object in that other software. The nature of the 2D representation is such that it can be displayed on a non-graphical output device and distributed by non-graphical means. The purpose served by this representation is to assist the user in visualizing and understanding the complex data structure or arbitrarily dimensioned object. This is the only known program that enables a programmer to map an n-dimensional data structure to a flat 2D space. This program does not depend upon the hardware characteristics of a particular output device, and can be executed on a variety of computers from different manufacturers. It can be distributed in source-code or binary-code form. It requires a Lisp compiler. It has no specific memory requirements and depends upon the other software with which it is used and application programs running in it. This software is implemented as a library that is called by, and becomes folded into, the development of other software.

This work was done by Mark James of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

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