

CVonline - an overview

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CVonline (homepages.inf.ed.ac.uk/rbf/CVonline) is one of the key online resources any image analysis student or researcher should bookmark. Its goal is to be a first point of introduction for every major image analysis concept, with enough content that you could determine if the concept is relevant to your current task. In short, it is a sort of online encyclopedia for computer vision, machine vision and image processing, etc. When we first started developing CVonline, in jest we subtitled it “The Evolving, Distributed, Non-Proprietary, On-Line Compendium of Computer Vision”, but this is close to what it has become. CVonline currently provides explanations for about 1100 of the 1400 listed vision related topics, organized into 19 top level categories. About half of the topics have tutorial-style explanations, with an example and with sufficient technical detail that the work can be reproduced.

Under each of the 19 top level categories is a further hierarchy. Some top level categories, *e.g.* representation, have many screens of topics. Others, *e.g.* non-standard architectures, have only a single screen of topics. Topics with content have hot links to one or more explanations of the topic, with over 3000 contributions.

At the moment, CVonline is accessed about 3500 times/week through its entry page and undoubtedly has many more direct accesses to topics through Google. CVonline has received over 400K accesses since logging started in November 1999.

Funding for the development of CVonline has come from a variety of sources: the European Community’s ECVision network, the British Machine Vision Association and the University of Edinburgh, particularly for the infrastructure. However, the main source of the content is the vision community, with direct contributions from about 350 people and many other “contributions” from authors with material on the web.

Technology behind CVonline

The tree structured topic pages were created in pure HTML (by hand) and conform to the “W3C HTML 4.01 strict” standard. Content pages are generated by a PERL script that is given the TAG number of the topic, with content generated from a flat plain text file database. The search engine is HTDIG (www.htdig.org).

A bit of history

CVonline was conceived in the pub (of course) in Vienna during ICPR, in 1996. We had been discussing the problems of textbooks for our classes - whenever you find a good

book, it seems to go out of print or become too expensive. We had also recently finished the HIPR (homepages.inf.ed.ac.uk/rbf/HIPR2) package and were excited by the possibilities of the web and control of the content. Within a year the basic structure was complete, with all the content listed after each topic label. The lowest level topics were inspired by a few textbooks and USC's Annotated Computer Vision Bibliography (iris.usc.edu/Vision-Notes/bibliography/contents.html). From that time, the basic hierarchy was set; however, there has been much re-arrangement of the structure to remove redundancy, remove mis-placed or mis-understood relationships and certainly to add new material. Several early collections of online course notes (Andy Wallace, David Marshall, Robyn Owens, Ian Young, Jan Gerbrands, Lucas Van Vliet, David Young) and conference tutorial notes (Boyle and Hogg/BMVC95, Zisserman/EPSRC Summer School 1995, Thacker and Cootes/BMVC96) got the content initialized. For the rest, we have asked conference paper authors whose research overlapped with CVonline topics, get a few voluntary contributions, have been web-surfing and have made creating a web page one of the assignments on our computer vision course. Now more than 80% of topics have content.

With the growth of the content links it eventually became hard to see the structure of the topic hierarchy. In 2003, we added the server-based PERL script method (funded by the ECVision network) that separated the topic tree from the content.

The most recent development was the catalog of vision related books, where we are trying to list all modern computer vision, image processing and closely related books. The catalog contains online books, books with online support sites, as well as traditional physical books. For editorial reasons, we decided to omit most conference proceedings. Currently we have 308 books listed (24 online, 30 web supported, 254 others). The growth rate of the field can also be seen from the book publication dates (1950's: 1; 1960's: 1; 1970's: 18; 1980's: 66; 1990's: 150; 2000-2004: 72).

Future Developments

The most realistic view of the future CVonline is one of incremental expansion. New topics and terms appear due to research developments. Given the great growth in research over the past 10 years, I fully expect that CVonline will also continue to grow in content.

What would an ideal resource consist of? The individual entries should be written and cross-referenced to a common level. The mathematical notation and terminology should be consistent, with a high level roadmap linking them. Each entry should have a set of examples, standard test datasets, free code for algorithms and an interactive exploration of the topic. There should be citations to deeper discussions of the topic.

I would have loved to have such a resource when I started and it is not technically impossible. But how to fund and find potential authors is a real problem, given the size of the task and steady growth of computer vision and image analysis.