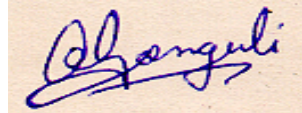


Flood Warning System Maintenance Manual

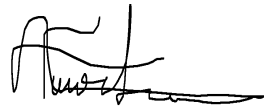
Kevin Berry



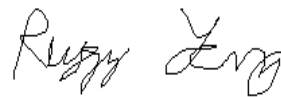
Ashes Ganguly



Alexander Giouzenis



Ruigang Yang



March 6, 2001

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1 Document Change History

- March 8: completed draft of manual.
- May 8: completed 1st version of manual.

2 Introduction

2.i Purpose

This document describes how the software is distributed among the directories and files. It also provides instructions on how to set up the software and run it.

2.ii Target Reader

The target reader is the maintainer of this software package.

2.iii Document Conventions

Directories are in **boldface** and files are in *italics*.

3 System Overview

The software consists of image processing modules written in C/C++; wrapped around by perl scripts. Perl scripts are also used to generate html pages, send mail, run user-defined scripts and generate plots using gnuplot. The cron daemon is used to run the software periodically. Figure 1 gives a overview of the high level structure of the software.

3.i Directory structure

The software package is divided into two top-level directories: **creekc** and **creekc-public**.

creekc is the main top-level directory containing the source code, executables, perl-scripts and configuration files. It is divided into the following directories:

- **bin**: contains the image processing executables and the script invoked by the cron daemon.

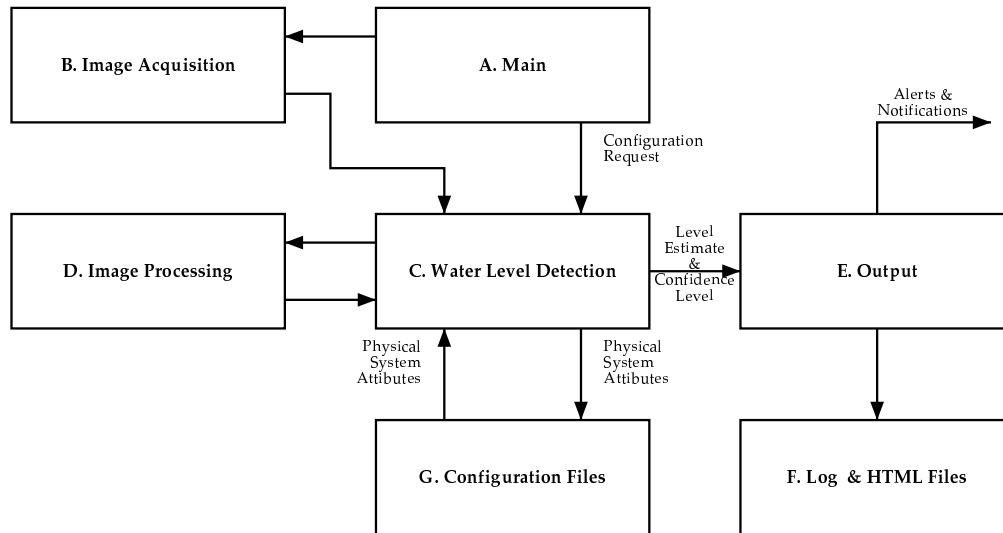


Figure 1: Design Structure

- **config**: contains the region-of-interest configuration files and the template pattern file for the daytime image processing module.
- **database**: contains the file "database" in which logs are kept.
- **html**: contains the files used to create the webpages.
- **input**: contains the input jpg files when the software is running on a remote machine with respect to the camera.
- **mail**: contains the mailing lists and template messages for mailing.
- **output**: contains the processed image, created by the image processing modules.
- **src**: contains the image processing source files and makefiles and the perl scripts.

creekcaml-public is the top-level directory for the files used for reporting the results of the software runs on the web. It should be placed in the **public_html** directory of the user who is installing the software. **creekcaml-public** contains the directory **cgi-bin** which holds the cgi scripts used to

generate plots of water-level vs. time and subscribe to the mailing list of water-level alerts.

3.ii File lists with locations

The files of the software package are listed along with a one-line description of the file.

- **creekcaml**

- **bin**

- * *CreekCam* - script invoked by cron daemon which calls the main procedure in wrap.pl.
 - * *day* - daytime image processing executable.
 - * *night* - nighttime image processing executable.

- **config**

- * *pattern.png* - template pattern used in daytime image processing.
 - * *roi-config* - configuration file holding region of interest parameters for both image processing modules.

- **database**

- * *database* - database file holding the logs of water-level confidence measure, status and recording time.

- **html**

- * *mainpage-lower-template.html* - template file containing the lower part of the web-page generated by the script.
 - * *mainpage-upper-template.html* - template file containing the upper part of the web-page generated by the script.

- **input**

- * input files got from the machine to which the camera is connected. The input files are stored here only if the software is running on a remote machine with respect to the camera. The naming convention is MMDD-hhmm.jpg where MM is the month, DD is the day of the month, hh is the hour (0-23) and mm is the minute.

- **mail**

- * *alert-mailing-list* - file containing list of email addresses to which mail must be sent when water-level crosses a threshold.

- * *alert-mesg* - file containing template of message which is mailed to the alert-mailing-list.
- * *setup-mailing-list* - file containing list of email addresses to which mail must be sent when confidence measure goes below a threshold.
- * *setup-mesg* - file containing template of message which is mailed to the setup-mailing-list.

- **output**

- output files created by the image processing modules. The naming convention is MMDD-hhmm-xxx.jpg where MM, DD, hh and mm are the same as defined for input files; xxx is "day" for output from the daytime module and "night" for output from the nighttime module.

- **src**

- *DayModule.h* - definition of the DayModule class.
- *DayModule.C* - implementation of the DayModule class.
- *detect_day.C* - file containing the main function for the daytime image processing module.
- *filter.h* - header file for the filter operations used by nighttime image processing module.
- *filter.C* - function definition of the filter operations used by the nighttime image processing module.
- *night.C* - file containing the main function for the nighttime image processing module.
- *Makefile* - makefile for the image processing modules.
- *wrap.pl* - file containing the main perl script which executes the various modules of the system.
- *definitions.pl* - file containing the definitions of variables used in the various perl scripts.

creekcaml-public

- *addemail.html* - html file which contains the html form allowing people to subscribe to the alert-mailing-list.

- **cgi-bin**

- *addemail.cgi* - cgi script in perl to add email to alert-mailing-list.
 - *dayplot.cgi* - cgi script in perl to generate plot of water level vs. time in days.
 - *hourplot.cgi* - cgi script in perl to generate plot of water level vs. time in hours.
 - *minplot.cgi* - cgi script in perl to generate plot of water level vs. time in minutes.
 - *plot-template.gnu* - template file used to create the input file for gnuplot to generate plots.
- *generateplot.html* - html file which contains the html forms allowing people to generate plots of water-level vs time.
 - *index.html* - front page for the creekcamera web report. Shows the current water level and confidence measure and a real image from the creek camera. Has links to the pages to generate plots and subscribe to alert-mailing-list.
 - **tmp**
 - Image files of plots requested in png format are stored in this directory.

4 Procedures

4.i Building the system

1. Go to <http://dhcp2785.dhcp.unc.edu/~creekcaml>
2. Download the source available as `creekcaml.tar.gz`.
3. Unzip and unpack to get the source by doing 'tar xzvf creekcaml.tar.gz'
A directory **creekcaml** should be created.
4. Do `cd watercam`.
5. Move the directory **creekcaml-public** to your **public_html** directory.
Use 'mv -r'.
6. Go into the directory **creekcaml/src**.
7. Edit the file *definitions.pl*. Change the variable \$ROOTDIR to the full pathname of the **creekcaml** directory.

8. Type 'make'.
9. You will need the OpenIL and ImageMagick image processing libraries available at <http://www.openil.org> and <http://www.imagemagick.org>.

4.ii Starting the system

The package will run as a cron job every 10 minutes executing the image processing and web-page generating modules. Set the cron daemon to run the script *CreekCam* in **creekcam/bin**. To change the interval, go into the file *definitions.pl* and change the variable \$INTERVAL_MIN.

4.iii Editing the Source

Right now the source is not under CVS control.

5 Appendices

5.i Development System Requirements

- OS: Linux
- installed software: perl - version 5.6.0
- plotting software: gnuplot - version 3.7
- compiler: GNU gcc/g++
- make system: GNU make

5.ii Example Input and Output

The input to the package is an image of the creek captured by a camera. The next page shows the output generated by the web-page module - it reports the water-level detected and a confidence measure. It also holds a link to the original image captured by the camera on which the image processing is done.

5.iii Contact Information

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The current developers can be found at:

http://sourceforge.net/project/memberlist.php?group_id=18776

5.iv Client Contract

The Client Contract is attached at the end as a separate document.

5.v Design Specification

The Design Specification is attached at the end as a separate document.