Single-Pass Rate Control with Lossless Region of Interest Coding for Pathology Imaging Software Manual

(version 1.0)

GICI group

Department of Information and Communications Engineering

Universitat Autònoma Barcelona

http://www.gici.uab.es - http://gici.uab.cat/GiciWebPage/downloads.php

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1 Description

This software is an implementation of a Single-Pass Rate Control with Lossless Region of Interest Coding employed in a recent research for coding Pathology Imaging. This research in under revision for the IEEE-ACCESS journal (https://ieeeaccess.ieee.org).
The zip file contains three folders:

experiments contains a variety of scripts, which **run.sh** is the script to be execute to reproduce, partially, the experiments provided in the manuscript.

images contains the images and the Region of Interest masks used in the experimental results presented. Only images and masks LYMP1, LYMP2, and LYMP3 are provided.

software folder stores all the software needed to reproduce the experiments. QEmpordaACROI contains the algorithm implementation of the Single-Pass Rate Control with Lossless Region of Interest Coding

2 Requirements

This software is programmed in Java, so you might need a JAVA Runtime Environment(JRE) to run this application. We have used SUN JAVA 1.8. To execute the software some scripts have been provided, thus a bash environment is also required. All this software have been validated in a macOS Catalina v.10.15.5.
In case you are interested into recompile the sourcecode we recommend to employ the Apache ant software tool (https://ant.apache.org).

3 Usage

The application is provided in QEmpordaACROI within a single file, a jar file (*dist/emporda.jar*), that contains the application. Along with the application, the source code is also provided. If you need to rebuild the jar file, you can use the `ant` command.

To launch the application you can use the following command:

```
$ java -Xmx1200m -jar dist/emporda.jar --help
```

In a GNU/Linux environment you can also use the shell script `emporda` situated at the root of the emporda directory.

```
$ ./emporda --help
```

To reproduce the experiments partially execute run.sh located in the experiments folder. It will produce the following output:

```
NCI01.3_1280_1280_1_0_8_0_0_1.raw_rc_3_roi_1_qstepROI_1_ccsds123_roicoding_ec_2_cm_1.results
0.067:1.039183:0.83594567:0.20319499:223.0:0.0:223.0:11.839154:Infinity:11.257168:205482
0.133:1.048079:0.83357257:0.21446452:246.0:0.0:246.0:12.676417:Infinity:12.094431:205482
NCI01.3_1280_1280_1_0_8_0_0_1.raw_rc_3_roi_1_qstepROI_1_ccsds123_roicoding_ec_2_cm_12.results
0.067:0.689606:0.6226139:0.06694987:221.0:0.0:221.0:14.887566:Infinity:14.30558:205482
0.133:0.757404:0.62444496:0.13291667:95.0:0.0:95.0:21.326265:Infinity:20.74428:205482
```

The description of the first line of the out is:

NCI01.3_1280_1280_1_0_8_0_0_1.raw is the encoded and decoded image.

rc_3 the rate control strategy employed. Further details see Coder.java line 562.

qstepROI_1 the Region of Interest is encoded with a qstep = 1, thus is losslessly recovered.

ec_2_cm_1 indicates the context modelling employed. cm = 1 refers to single context modelling and cm = 12 to full context modelling.

The rest of the lines contains the following information delimited by :.

output1 is the target bit-rate

output2 is the total bits per sample

output3 is the bits per sample employed for the Region of Interest

output4 is the bits per sample employed for the non Region of Interest

output5 is the Peak Absolute Error for the entire image

output6 is the Peak Absolute Error for the Region of Interest

output7 is the Peak Absolute Error for the non Region of Interest

output8 is the Signal Noise Ratio Error for the entire image

output9 is the Signal Noise Ratio Error for the Region of Interest

output10 is the Signal Noise Ratio Error for the non Region of Interest

output11 number of Region of Interest Samples

4 Notes

If you need further assistance, you might want to contact us directly.