ATRC

Grand Alliance Compression Tests

Overview

Proposed improvements to a baseline MPEG-2 compression (without B-frames) will be evaluated by computer simulation and impartial expert evaluation of picture quality. Grand Alliance executives will determine whether the performance/cost benefit of each improvement justifies its cost. If agreement cannot be reached within the Grand Alliance, the proponents agree that: 1) the improvements will be included as "options" in Grand Alliance prototype hardware that will be evaluated during testing, and 2) the final decision on the inclusion of "options" will be made by the Advisory Committee. Proponents have an incentive to decide the issues themselves, because building and testing "options" will raise the cost of finalizing the Grand Alliance system.

Process and Schedule

The Grand Alliance will use the current MPEG-2 Main Profile without B-frames as a baseline system, at an agreed upon resolution and data rate. The proposed improvements will be limited to: B-frames [ATRC], leaky prediction [AT&T], and 8x8 inter/intra [GI]. The proposed improvements will be compared to the baseline system to determine whether the performance of an improvement justifies its cost. The following steps will be taken:

- the Grand Alliance technical group will select 5 test sequences from official ACATS test material, and agree on baseline sytsem parameters (resolution, data rate, etc.) [May 24].
- the Grand Alliance technical group will run computer simulations of baseline and improved systems on all 5 sequences (in interlaced and/or progressive formats, as appropriate) and transfer results to ATTC [June 20].
- an impartial panel of 5 experts (Hopkins, Henderson, Richer, McMann, Cicora) will perform a "blind" evaluation of picture quality at ATTC, and rate the improvements (the improvements will not be identified for the expert viewers) [June 30].
- the Grand Alliance technical group will agree on a receiver cost estimate for each proposed improvement in the years 1996 and 2000 [June 30].
- Grand Alliance executives will reach consensus on the improvements that are justified on a performance/cost basis to become part of the Grand Alliance system [July 7].

In the event that an proponent consensus on performance and/or cost cannot be reached within the Grand Alliance, the proponents agree that:

- proposed improvements will be built into the Grand Alliance prototype hardware system as "options" that will receive further evaluation and testing by the Advisory Committee.
- a binding decision will be made by the Advisory Committee after evaluation of the test results of the Grand Alliance system.

Technical Details of Computer Simulation Experiments

The proponents agree that:

- each proponent of an improvement to the baseline Grand Alliance system will provide the detailed encoding algorithm and syntax for the improvement (so that other proponents may encode and decode for verification) [May 30].
- all proponents will produce compressed bitstreams for a baseline Grand Alliance system for each test sequence, which will be decoded by at least one other proponent.
- at least two proponents will produce a compressed bitstream for each proposed improvement on each test sequence, and at least two proponents will decode another proponent's compressed bitstream to verify syntax, bit rate, etc. [compressed bitstream exchange June 15].
- in the picture quality evaluation by impartial experts, decoded bitstreams will be compared (note that the decoded bitstream is produced by a Grand Alliance member other than the one proposing the improvement - this guarantees a fair test).
- in the picture quality evaluation by impartial experts, each proposed improvement will be compared to the best baseline performance submitted by any proponent.

ATRC

Grand Alliance Compression Tests

	B-frames [ATRC]	8x8 inter/intra [GI]	Leaky Pred. [AT&T]
source format for experiment	interlaced	interlaced	progressive
resolution	1408 x 960	1408 x 960	1280 x 720
data rate	19.0 Mbps	19.0 Mbps	19.0 Mbps
decoded baseline for evaluation	best from any proponent	best from any proponent	best from any proponent
decoded improvement for evaluation	GI	AT&T	ATRC