

Dear All,

For those who are working on your own JPEG encoder and/or Decoder, the following reference is highly recommended:

[Ref 1]. The Design, Implementation, and Deployment of a system to Transparently Compress Hundreds of Petabytes of Image Files for a File-Storage Service, Proceedings of the 14th USENIX Symposium on Networked Systems Design and Implementation (NSDI'17), March ,2017

This paper reported the Lepton Image Compression method, which can losslessly compress JPEG images further and has been adopted by Dropbox.

And you can find the open source related information at <https://github.com/dropbox/lepton> .

With the aid of VP8 Arithmetic Code, a special arrangement of AC and DC components of an 8x8 DCT transform, and a prediction of DC from ACs, Lepton achieves a 22% saving reduction of existing JPEG images. You are encouraged to include Lepton-liked mechanism into your codec and present it as your final project.

If you are confidence in your coding techniques and interested in real time multimedia coding, then the following reference is recommended:

[Ref 2]. Salsify: Low-Latency Network Video through Tighter Integration between a Video Codec and a Transport Protocol, Proceedings of the 15th USENIX Symposium on Networked System Design and Implementation (NSDI'18), April 2018.

This work presents a new architecture for real-time Internet Video that tightly integrates a video codec and a network protocol, allowing it to respond quickly to changing network conditions and avoid provoking packet drops and queueing.

This subject, of course, can be presented as your (a team with up to 4 members) final project of our ITCT course.

If your research interest is much more system related, for example, Operational systems, Functional programming, and Cloud and/or parallel programming, then the following reference is strongly recommended:

[Ref 3]. Encoding, Fast and Slow: Low-Latency Video Processing Using Thousands of Tiny Threads, Proceedings of the 14th USENIX Symposium on Networked System Design and Implementation (NSDI'17), March 2017.

This work described the ExCamera system, developed by a team consisting of members from Stanford, UC Sa Diego, and MIT, which can Edit, Transform, and Encode a video, including 4K and VR materials, with low latency.

The implemented video coder intended for fine-grained parallelism, using a functional-programing style that allows computation to be split into thousands of tiny tasks without harming compression sufficiency.

This subject, of course, can be presented as your (a team with up to 4 members) final project of our ITCT course.