NOVEL ARCHITECTURE FOR MULTIMEDIA HARDWARE ACCELERATION

Universidade Vigo

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Motivation of the work

The technology of telecommunication networks has been evolving in the last years (4G and 5G).

Multimedia communication usage (mainly video) is growing so rapidly (video traffic will be 79 percent of all consumer internet traffic in 2018, up from 66 percent in 2013 [1]).

The mechanism of multimedia communication has to be developed in order to provide new services for 4G and 5G networks and guarantee the quality of experience for users (extend bandwidth and minimize latency and start-up time).

Thesis Objectives

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- Design a novel architecture for multimedia for the new telecommunication networks.
- Design new architecture of hardware accelerated mechanisms to manipulate video.

Research Plan

First year research plan

First stage(first year 2014/2015): review of the state of the art and identification of areas of contribution

- Establish an essential knowledge of GStreamer [2].
- Establish an essential knowledge of hardware video acceleration [3][4].
- Establish an essential knowledge of the media server [5].
- Review the data sheets of different. manufactures of hardware video acceleration.
- Initial design of architecture for multimedia hardware acceleration.

Second and third year research plan

Second stage(second year 2015/2016): contribute with new ideas and publications

- Design a novel architecture for multimedia for the new telecommunication networks.
- Design new hardware accelerated mechanisms to manipulate video.
- Participate in scientific conferences.

Final stage(third year 2016 /2017): write and present the dissertation

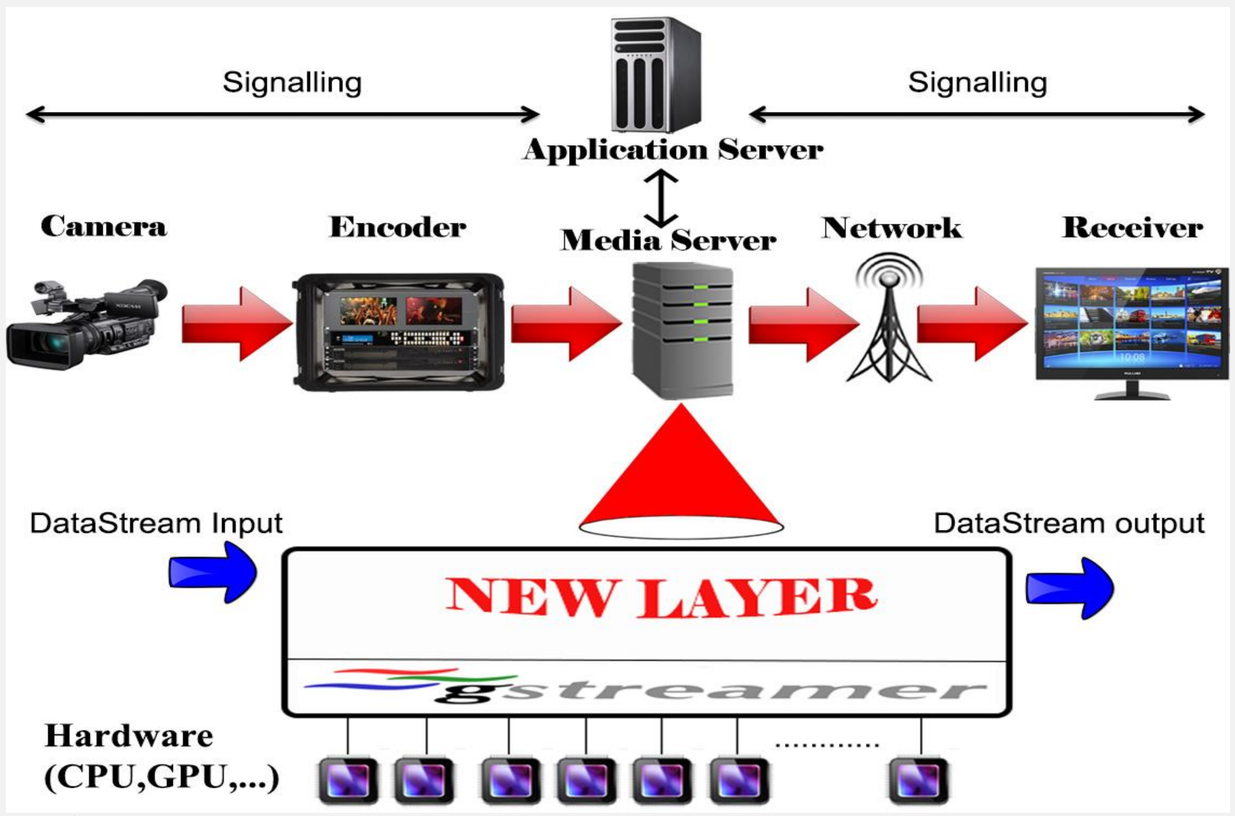
- Submit a journal paper.
- Write the final report.
- Present the dissertation.

Next Year Planning

After working for the first year, we see a clear contribution in this field of research and we will implement it in the next year.

Test the performance of different hardware acceleration.

Design and implement a new layer in media server which has all information (capabilities, frequency, codec…) about different devices (CPU, GPU…).
This layer receives DataStream and decides which device will be used by GStreamer in order to process the DataStream.



Attendance to at least one international conference or workshop.

References

[1] Cisco Visual Networking Index: Forecast and Methodology 2013–2018, June 2014.
[2] GStreamer Application Development Manual [Online]. Available: http://gstreamer.freedesktop.org/
[3] X. Nui, L. Galarza, Y. Gao, J. Fan. "Software-hardware co-design for video coding acceleration" In Southeastern Symposium on System Theory (SSST) , Jacksonville, FL, March 2012,pp. 57 – 60.
[4] D. Min, Q. Rongcai, W. Ruiping, B. Sheng, C. Wenyi, X. Jiayi ,''A new high-definition video player method based on GPU technology'', In international Conference on Cyber Technology in Automation, Control, and Intelligent Systems (CYBER) ,Bangkok, May 2012, pp.388 – 392.
[5] H. Wang, J. Li , C. Zhao , Z. Ying,'' Design of an Embedded Streaming Media Server in video monitoring" In International Conference on Natural Computation (ICNC), Shenyang, July 2013, pp. 1324 – 1328.