

## EE/CprE/SE 492 WEEKLY REPORT 2

1/27/24 – 2/10/24

Group number: 12

Project title: *Pipelined Video Compression & Decompression on FPGA*

Client &/Advisor: *John Deere & Joseph Zambreno*

Team Members/Role: *Colsen Selk - Software, Kareem Eljaam - Hardware, Caleb Rock - Hardware, Benjamin Meinders - Software, Logan McDermott - Hardware*

### ○ **Weekly Summary**

These past two weeks we focused on two things. First, some of us focused on getting a working HDMI passthrough on our dev board. This objective was successfully completed and a more in depth passthrough is underway. Second, some of us focused on implementing a compression algorithm in Java and C, and looked into some additional algorithms such that the one we are working with may not be the best choice.

- **Past week accomplishments** *(Please describe/summarize as to what was done, by whom, when and, collectively as a group. This should be about a paragraph or two in length. Bulleted points are acceptable as well. Please keep only your technical details related to your project. Figures, schematics, flow diagrams, pseudocode, and project related results are acceptable, but please ensure that they are legible (clear enough to read) and to provide an explanation. If researching a topic, please add a few details about what was learned and how it is relevant to the project. If two or more people worked on a single task, be sure to distinguish how each member contributed to the task. Specific details relating to the assistance provided to other members may be included here. **Do not include classwork, such as individual reflection assignments, and group meetings as part of your duties.**)*

- Colsen Selk: Worked on testing LZW compression stats, and coding for that.
- Ben Meinders: Worked on implementation for LZW in Java and planning to migrate to C. Collaborated with Colsen for progress on the algorithm.
- Caleb Rock: Worked on HDMI pass through. Worked on the troubleshooting and set up of the Zybo z7 for the passthrough. Worked with Logan to follow the Digilent tutorial for the passthrough.
- Kareem Eljaam: Worked with Logan and Caleb on debugging why the passthrough had resolution issues. Also looked into and researched parts of the FPGA block design, how our future IP core/s will fit in, and the passthrough IP core that Dr. Zambreno sent us.
- Logan McDermott: Worked with Caleb to follow the Digilent tutorial for the passthrough.

Came back in to fix resolution issues and research premade IP cores. Also found an LZW compression algorithm implementation and experimented compressing images and text files.

- **Pending issues** *(If applicable: Were there any unexpected complications? Please elaborate.)*
  - Colsen Selk: found another algorithm (Burrows Wheeler Transform) in case LZW does not meet compression requirements.
  - Ben Meinders: Create LZW in C and benchmark any other algorithms we find in the coming week.
  - Caleb Rock: Had complications with setting up the Zybo z7 for the pass through but worked with ETG to get it figured out.
  - Kareem Eljaam & Logan McDermott: We are considering using a premade IP core from Xilinx but are unsure if we can obtain the licensing or if it is suitable for our client.
- **Individual contributions** *(Creating this section is optional, but it is **Required to include the "Hours Worked for the Week" and their "Total Cumulative Hours" for the project for each member somewhere relevant in your report. Your individual weekly hours should be at a minimum of 6-8 hours for this course. So please manage your time well. Also, ensure that individual contributions support your claim to the weekly hours. Be honest with the reports.)***

<b><u>NAME</u></b>	<b><u>Individual Contributions</u></b> <i>(Quick list of contributions. This should be short.)</i>	<b><u>Hours this week</u></b>	<b><u>HOURS cumulative</u></b>
Colsen Selk	Worked on C compression algorithm and testing	6	16
Logan McDermott	Worked on HDMI pass through. Got Zybo z7 set up.	6	13
Caleb Rock	Worked on HDMI pass through. Got Zybo z7 set up.	6	13
Ben Meinders	Implementation of LZW in Java and C	6	14
Kareem Eljaam	Worked on HDMI pass through. Got Zybo z7 set up.	6	13

- **Plans for the upcoming week** *(Please describe duties for the upcoming week for each member. What is(are) the task(s)?, Who will contribute to it? Be as concise as possible.)*
  - Ben Meinders: Create LZW in C and benchmark any other algorithms we find in the coming week.

- Colsen Selk: Will test BWT if LZW does not meet compression requirements. Otherwise, will prepare and help in LZW creation in C. Ben says compression tests are looking good after a small change, so most likely will be helping in C implementation

- Caleb Rock: Will work on running a passthrough with the Vivado block diagram. Research implementing IP cores into the Vivado block diagram.

- Kareem Eljaam: Touching base with the client to update him on where we are at. Also will look into the example IP block that Dr. Zambreno provided us with.

- Logan McDermott: Looking into licensing for premade IP cores, and planning to implement Dr. Zambreno's skeleton code into our HDMI passthrough.