

# HWSW LU – Optimization Criteria

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While the main goal of the lab exercise is to successfully complete the main task and display the decoded video in enjoyable quality, in this course the focus is not only on developing solutions, but developing *good* solutions. This document is to define what *good* means. First of all, there are minimum requirements for a valid solution:

1. The video stream shall be fully decoded – no information about pixel data shall be left unprocessed (leaving only metadata like the sequence header allowed for skipping).
2. The average frame rate shall be no lower than 10 fps, the overall jitter (difference between the largest and the smallest time between two displayed pictures) shall not exceed 10 ms.

From the huge design space, you should target your solution to have the least implementation cost. The cost of a solution is defined as the sum of costs of all resources you need. Refer to the following table for the individual costs. For external memories, always round up the amount you need to the next power of two.

Amount	Type	Cost
1	Logic Element	1
1024 bit	On-Chip Memory	28
1	9x9 HW-Multiplier	221
1	PLL	14425
1024 bit	SRAM	3,4
1024 bit	SDRAM	0,04
1024 bit	FLASH	0,17

Consult the tutors about how to measure the resource requirements of your design. Additionally to the hardware costs, there is a “cost” associated with the performance of your solution. This would allow using a (much) smaller hardware solution even if it performs slightly below the specified goal (15 FPS):

FPS Range	Cost
$FPS < 10$	$\infty$
$10 \leq FPS < 15$	$25000 * (15 - FPS)$
$15 \leq FPS$	$0$