

# How To Write Fast Numerical Code

## Course Project

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### 1 Cost analysis

In the Table 1 below are included all of the operations used in the source code for filtering methods. The counting was done in the source code, no instrumentation used.

The following variables are used in Table 1:  $W$  - width of the processed image,  $H$  - height of the processed image,  $N$  - number of filtering iterations.

Operation	filter	TDBF	CumSum	all
add	$6HW$	$2 * N * 4HW$	$2HW$	$(8 + 16N)HW$
sub	$6HW$	$2 * N * 4HW$	0	$(6 + 16N)HW$
compare	0	$2 * N * 4HW$	0	$(8N)HW$
multiply	$2HW + 3N$	$2 * N * 3HW$	0	$(2 + 6N)HW + 3N$
divide	$N + 1$	$2 * N * HW$	0	$(2 * HW + 1)N + 1$
fabs	$6HW$	0	0	$6HW$
sqrt	$3N$	0	0	$3N$
powf	$2N$	0	0	$2N$
addlike	$12HW$	$2 * N * 12HW$	$2HW$	$(14 + 24N)HW$

Table 1: Floating point operations performed in the code