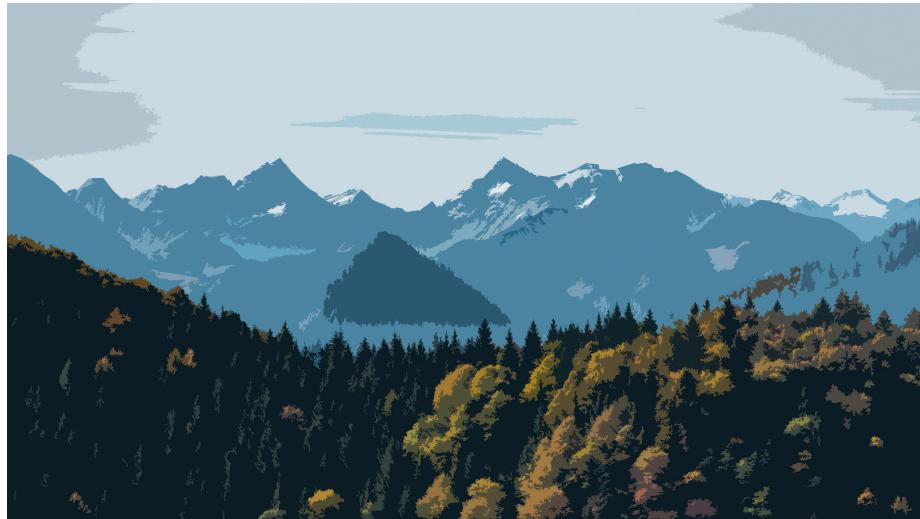


## Part 1: Parallel image convolution using MPI

### Results

#### Input

Using this original image (3840 x 2160 pixels):



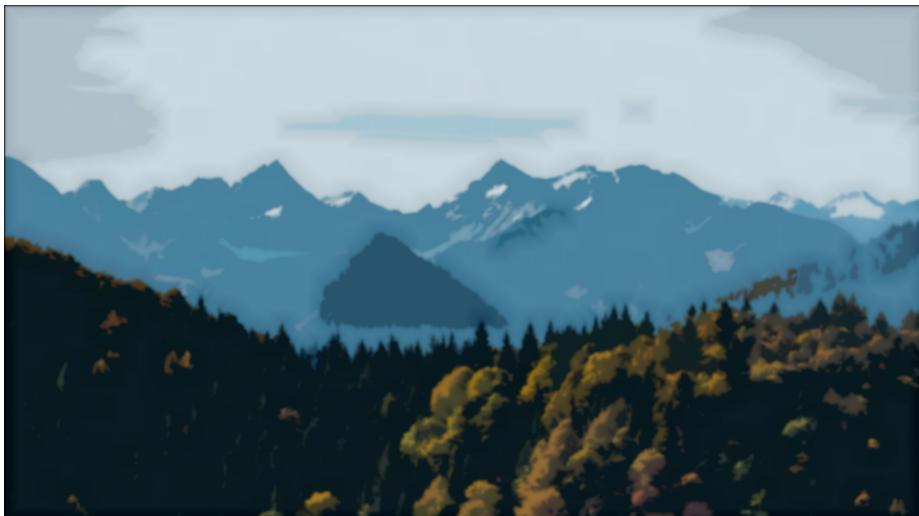
Both output images are run with kernel 5 ‘Gaussian’ which blurs the image. I run it with 8 processes for 32 iterations. To run with more processes than i have cores i use the `--oversubscribe` flag:

```
mpirun --oversubscribe -np 8 ./main -k 5 -i 32 images/input.jpeg images/output.png
```

Original Output



Output after completing the tasks



### Speedup

#### Running on Oppdal Server (4 cores)

```
Apply kernel 'Gaussian' on image with 3840 x 2160 pixels for 32 iterations
1 Processes used: 56.302354 seconds
2 Processes used: 28.335866 seconds = 1.989 Times Faster
4 Processes used: 14.943658 seconds = 3,768 Times Faster
```

8 Processes used: 15.473029 seconds = 3,639 Times Faster

**Running on my computer (6 cores)**

Apply kernel 'Gaussian' on image with 3840 x 2160 pixels for 32 iterations

1 Processes used: 54.159191 seconds

2 Processes used: 26.984803 seconds = 2.007 Times Faster

4 Processes used: 14.737562 seconds = 3,674 Times Faster

8 Processes used: 11.186613 seconds = 4,842 Times Faster