

I would like to start with the idea that come to me that hpc actually not just help to improve the performance, save time, but also, it made our lives more beautiful. At least look at fractal pictures or small videos with there evaluation. It is amazing. Do not know for now if in c# hpc we can see such a lot of beauty, but without a doubt it will make live more comfortable.

I got a bachelor's degree at the Institute of Computational Mathematics, RAS. So, from the name of the institute it is quite clear that scientists from there try to solve hard, big, dangerous problems using huge number of computations. Because of this, some students (older then we were) got problems like «improve existing code, accelerate it». Every per sent of acceleration was a success, cause per sent in time, computing something on enormous grid size could save hours. Nevertheless, nobody from my group mates was doing any kind of high performance computing. Problems were small, mostly theoretical. I got a problem of classification, but data size was small too. So, I was not familiar with hpc before Python Lab in Skoltech, but I understand that it is just a very very beginning. I am a bit afraid of it for now, mostly becomes now nothing in hoc for c#, but believe in good results and come of understanding.

Now I am working with neural networks (also at very beginning, cause before Skoltech knew nothing) and can imagine how hpc could help. In Python Lab course we tried to parallel some convolution tasks or just tasks with big data. All of this is presented in networks. However, in my project I work with simple functions and Axon type network. It is mostly sequential, but maybe an optimisation part of task could be somehow paralleled, but they are very small for now. Maybe in future, when I become more confident and will have done some part of work with visualisation, requiring lots of computations on a grid to find local/global minimums and generally the behaviour of the function, depending on huge amount of parameters (net has very a lot params). To make something beautiful, I will need hpc. But I have a concern that would not succeed in making it till the end of the term.

Lots of interesting examples of hpc usage were described on the lectures. Nowadays, I believe, almost everywhere it is already implemented, except some new fields, cause all of us need to save our time and keep up with the times. I tried to find where in my life it would help. Quite egoistic from me, but it is the easiest way perhaps. One stupid example: all of us now tackle with the problem of low activity, especially for me it is disappointing. So, I try to watch online videos with training, especially cardio ones, where the coach moves fast and very often changes the movements in all parts of body. The couch does not see people, the people see the plain form of the trainer. What if someone made an app, which records the training of all people beside the screen, following the trainer and process them, in the way «how perfect they repeat movements». It could compare it with ideal ones, which will be invented or with the coach. It should process thousands of videos and make fast answers for all people in the same time. So, the parallelisation and other hpc techniques are needed. All processes will work with some part of videos, performing the algorithm of comparison and extraction. This will help to overcome walls and screens and make people understand their mistakes and force to make next time better. Trainer will understand which movements were difficult and should be explained more precisely. But may be it is too confused.