Improving brain simulations by using heuristics Popular science description - Degree Project in Computer Science, DD150X

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The human brain is a very complex organ. Unfortunately, it can develop disorders such as Alzheimer's disease and dementia. The better neuroscientists understand how the brain and its diseases work, the better they will be able to develop treatments and preventions. To do so, scientists make use of simulations of the brain. However, the brain is very complex and it is impossible to simulate it utterly with today's technology. Therefore, the bigger the region scientists can reproduce, the greater understanding of the brain they will obtain and the better treatments they will produce.

When a neuroscientist wants to research a region of the brain, they will obtain an accurate representation of the types of neurons. Then they will recreate the neurone network defining the connections between neurons. Finally, they will simulate the signals exchanges between neurons. The task of establishing the connections is really time-consuming and computationally hard. To spped up this task, we tried to bring some heuristics used in computer graphics for ray tracing, but they had no effect on the execution time. If there is more research in this field, it will promote better and more efficient healthcare for everyone.