

Deep learning AI is speeding up Parkinson's disease research at Sanofi

**Can Kayatekin, Senior Scientist
Sanofi**

NEUROSCIENCE, PHARMACEUTICAL RESEARCH

Can Kayatekin, a Senior Scientist at Sanofi, runs a group in his lab studying Parkinson's disease (PD). Their mission is to find both targets for therapeutic intervention and to elucidate the diseases' pathophysiology. One of the most time-consuming aspects of his team's job is cell counting, specifically counting neurons positive for Tyrosine hydroxylase (Th), an enzyme known to be significant in PD.

"We have a lot of counting to do. One of the differences between industry and academia is the number of animals we typically use, like three times as many. So, things do not scale so well," Can explains. Not only is this task time-consuming, it is also difficult with traditional, manual methods "It is sometimes hard to recognize or discriminate what we are looking for from background," Can adds.

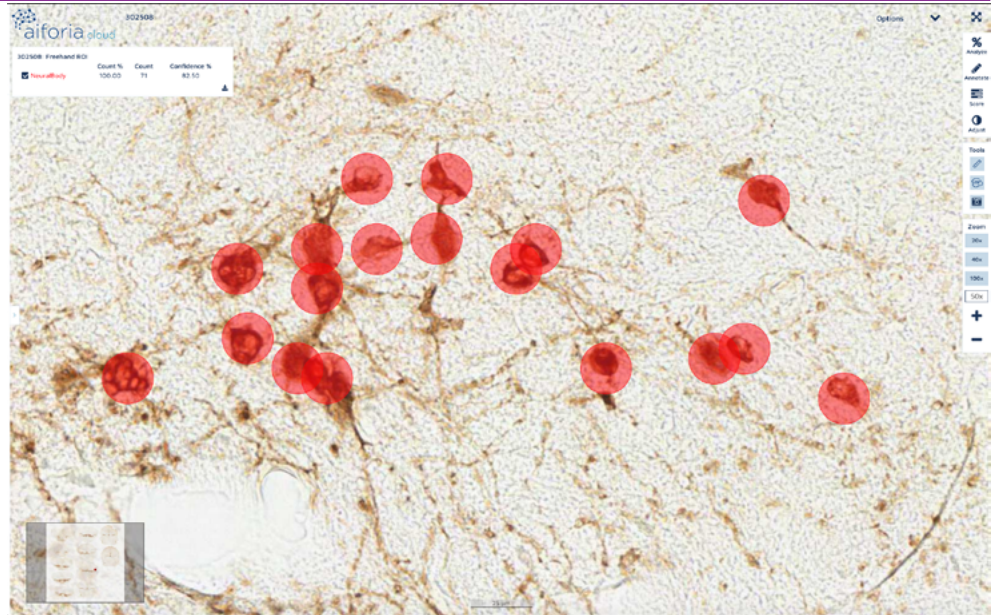
Aiforia had an existing algorithm for counting Th+ neurons, allowing for this manual task to be automated and delegated to deep learning AI models. Aiforia's AI model was modified and optimized to fit Can and his team's work as the AI model was trained with the Sanofi data set "It worked really well for our purposes and it was really pain-free on our side," Can explains as he discusses how this training was done with Aiforia: "I really liked the collaborative aspect of it. They, the Aiforia scientists, were trying to get it right as much as we were trying to get it right, which feels good. A lot of times a company will just give you a product and not be able to tweak it for you. But with Aiforia it felt more like a collaboration."

Training was complete when Aiforia's AI model reached a high-degree of accuracy, as Can explains from doing quality control to validate the performance of the software: "The Aiforia AI model was about as accurate as any of the human counters were. My expectations were high. And the platform met those."

In total 75 slides, with up to 10 sections per slide, were analyzed and over 150,000 objects were detected and counted by Aiforia. "If you worked 24 hours a day, counted 1 object a second, it would take you a day and a half to count all those objects manually."

The Aiforia AI model was about as accurate as any of the human counters were. My expectations were high. And the platform met those.

"It removes the hurdle of someone sitting down and counting these cells. The counting is not something anybody likes doing. It is a high-annoyance activity. It is a good thing to delegate to a computer if you can."



So, assuming you work your normal 8 hours, you are still looking at counting, every second of a whole day, for a whole week. Your eyes get tired after looking at these images, you start to second-guess yourself. The consistency across each of the sections was great with Aiforia, it doesn't get tired," Can elaborates on what it would have been like doing this volume of work with traditional methods versus using the Aiforia Platform.

Can and his team will continue to use Aiforia for other animal studies as more counting needs to be done. "It removes the hurdle of someone sitting down and counting these cells. The counting is not something anybody likes doing. It is a high-annoyance activity. It is a good thing to delegate to a computer if you can."