

# ADGS Computer Systems:

## Developers of Cutting-Edge Algorithms to Build Futuristic Applications



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DGS is the very first Deep Technology startup of Qatar, established in 2015 by a Qatari businessman, a French entrepreneur, and a small team of brilliant international scientists : engineers, a mathematician, a biologist, a phlebologist and surgeon, they all are deeply involved in fundamental research but also in philosophy. The idea behind ADGS is to conduct R&D and create cutting edge algorithms to build futuristic applications, but not just any algorithms:

- They had to be ethical and for the benefit of all.
- They had to be related to humans, making computers understand complex human behavior like linguistic or social.

ADGS faces unique challenges: incredulity, frequent

misunderstanding and confusion with digital tech like e-commerce, social platforms, or service helpers apps. Of course digital tech is great but it is not the technology that is going to help us solve the really pressing problems of our time, like feeding billions across the globe or undo the tremendous amount of environmental damage we have done or help us face the tremendous amount of healthcare issues we are facing now.

Deep Technology encompasses fundamental sciences like biotechnology, Artificial Intelligence, Agent-Based Modeling, where digital tech is just a quick fix. It is with this idea in mind that ADGS was founded : Deep Technology companies like ADGS have a strong research base. They create value by developing new solutions. They are advancing the technological frontier.



**Christophe Billiottet,**  
CEO

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ADGS Computer Systems is now recognized as one of the 50 most Innovative Companies of the year 2021.

"5 years of R&D have been necessary to deliver three products, three algorithms should I say. The first one is a neuromuscular algorithm used to recognize users by their typing on a regular keyboard. The second one is an unstructured big data analysis using Artificial Intelligence and natural language processing, and the last one is the most sophisticated: it is a set of algorithms that can simulate mineral, biological or social phenomena," said Christophe Billiottet, CEO of ADGS. "This powerful algorithm is a precious help for any decision-maker, as, for the first time, it allows to visualize and understand the outcome and consequences from policies before promulgating them. Imagine that with such an algorithm, most very complex decisions could be made right".

This sounds theoretical, but the number of practical applications of ADGS algorithms is impressive, from predicting the near future of a pandemic, improving autonomous car safety, improving cybersecurity with AI, optimizing the emergency evacuation of a building, and much, much more.

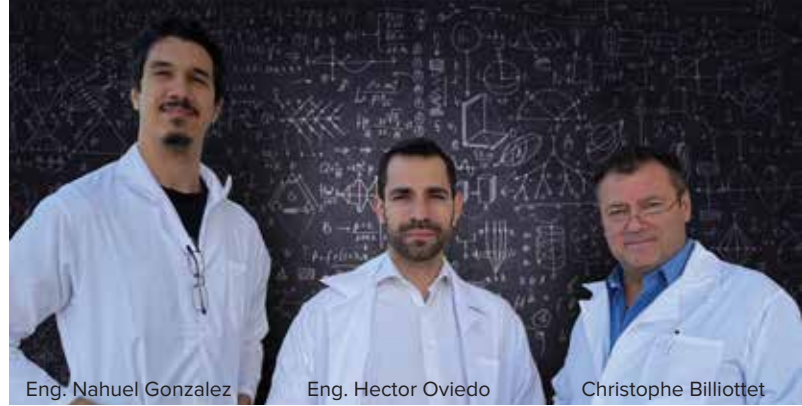
PANDEXIT is the first pandemic predictive system that simulates the broad social dynamics of a country so that, once virus hot spots are known, experts can develop models of how, when, and where people are likely to move and interact. Then, drawing on that knowledge, PANDEXIT simulates the infection spreading and test relevant strategic plans for dealing with the the virus.

"How many times did I hear from epidemiologists to whom we were offering PANDEXIT "we are busy now, we will talk when the pandemic is over". However, some clever teams working on the COVID-19 have been able to understand that a tool like PANDEXIT could greatly improve their predictive abilities, producing much better advice to the decision-makers," added Billiottet.

Every entrepreneur faces challenges while setting up a business. The customers ADGS meets are large companies, governments, and institutions, and their problems can often be solved using ADGS' technologies. Once the team understands the client's challenges, they think out of the box and provide innovative and creative solutions.

"We love to sit with a customer with identified or unidentified problems and help to solve them. The more complex the problem, the more interesting it is to us", says Billiottet.

For instance, a Country's Ministry of Commerce and Industry had decisional issues that could be solved by ADGS's business dynamics modeling to analyze policies and strategies, focusing on business and public economic policy



applications. Business dynamics is a perspective and a set of conceptual tools that enable understanding complex systems' structure and dynamics. ADGS built a simulation system that strategically tests new economic policies and show their outcomes in real-life, taking into account geopolitical strategies and global economy.

At the request of an Argentinean Research Institute, ADGS developed algorithms to build simulations of the human cardiovascular system to help the institute investigate a treatment designed to avoid amputations following a necrosis, with extraordinarily promising results.

One of the problems companies face is the "The Password Challenge." People write down or use the same password several times, share passwords or lose them, defeating passwords' very purpose. Only one solution is safe enough, by moving the process's complexity onto the computer instead of onto the human. ADGS designed an algorithm, STROKK, that learns the neuromuscular processes between the brain and a user's fingers by learning his interactions with a regular keyboard. By learning and identifying his specific keystroke dynamic, the computer can then recognize him or her. STROKK has been built in-house and is so reliable that banks already use it.

ADGS also built an ultra-resilient transmission system to communicate several hundred kilometers away that can resist any jamming. Aside from the radio transmission protocols, the organization provides different systems for the ICTE program (Civilian Space Program from Argentina) and LIA Aerospace and develops rockets trajectory control, parameters monitoring and radio communications. LIA Aerospace is the first company worldwide to successfully launch a biofuel-powered rocket, followed few days later by bluShift Aerospace from NASA and the Technology Institute from Maine.

ADGS works at an intense level of biological and sociological algorithms with many applications in the real world. Supported at first by the Qatar Foundation, ADGS was awarded by 500Startups (USA) in 2019 and by the World Innovation Summit for Health in 2020 as one of the 15 most innovative health startup in the world.

ADGS is a laboratory that transforms current mathematical concepts to create the products of tomorrow.