

Case Study: Stock Exchange

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Client

An extremely large, globally known, American stock exchange.

Challenge

A large stock exchange was suffering from occasional system failures. When these failures occurred the markets would go down, making international headlines and causing large losses.

Given the extreme complexity of the exchange, there were innumerable possible causes of failure, and these could not easily be monitored to predict failure ahead of time, meaning resources couldn't be deployed to avert a failure before systems completely shut down.

Our task was to predict failures before they occurred so that technical teams could respond before systems shut down.

Solution

To predict when the system would fail, we produced several physics-informed mathematical models of how the complex system would work. We then built a machine learning tool that used the models to make predictions about what could happen to the system.

With this Machine learning tool in place, we could consistently make predictions about system problems before they began affecting performance. These predictions were then fed into an easy to read dashboard that could be understood not just by technical staff, but also by executives who had a stake in monitoring the performance of the system.

Results

After passing testing the fully functional system moved onto production servers where it runs on a live feed of data, allowing for constant system monitoring and early failure diagnosis. Since installation we have not been made aware of any system issues being able to progress undetected to the point where they triggered a market outage.

Client renewed contract several times and offered several jobs as a permanent part of their operations.