

Sony's AI system GT Sophy beats 95% of human competitors at Gran Turismo Sport

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A collaboration between engineers at Sony AI, Polyphony Digital Inc. and Sony Interactive Entertainment has led to the development of an AI application called GT Sophy that is capable of playing the Formula 1 car

racing video game Gran Turismo Sport. In their paper published in the journal *Nature*, the group describes how they created the AI app and how well it performed when competing against human competitors. J. Christian Gerdes, with Stanford University, has published a News & Views piece in the same journal issue outlining the work by the team and why GT Sophy may represent a new step forward in the design of AI systems.

As Gerdes notes, Formula I racecar driving is a truly difficult endeavor. Not only do drivers have to master the intricacies of their car, they must also contend with the unpredictable behavior of their competitors and oftentimes the head-scratching calls of officials. In this new effort, the researchers challenge the notion that such skillsets are the exclusive province of human drivers. They built an AI system capable of beating humans competing in a video game that very accurately mimics the real thing.

GT Sophy is, more specifically, an autonomous AI agent trained with deep-learning reinforcement. It learned how the video game works and was rewarded when it did things well and penalized when it did not. Over time it improved, even learning the nuances of the tactics used by professional racecar drivers. It also learned the rules of etiquette to ensure [fair play](#). Once confident of its abilities, the research team pitted the AI against human competitors and found its abilities improved to the point where it could beat 95% of its opponents.

In announcing its [press release](#), Sony noted that in addition to the technical breakthroughs made in developing the application, the company has also demonstrated how AI systems can add to the overall experience for players. And as Gerdes notes, the lessons learned in teaching GT Sophy how to race against humans will very likely be applied to real-world autonomous driving systems and as a training aid for [drivers](#). He notes that during testing of the system, driver Kazunori

Yamauchi used the system to correct a problem he encountered while taking turns a the Nürburgring Grand Prix track in Germany.

More information: Peter R. Wurman et al, Outracing champion Gran Turismo drivers with deep reinforcement learning, *Nature* (2022). [DOI: 10.1038/s41586-021-04357-7](https://doi.org/10.1038/s41586-021-04357-7)

J. Christian Gerdes, Neural networks overtake humans in Gran Turismo racing game, *Nature* (2022). [DOI: 10.1038/d41586-022-00304-2](https://doi.org/10.1038/d41586-022-00304-2)

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