Evolutionary Computing, or "What Would a Computer Do?"

The computers are at it again, this time challenging humans in a Go competition at the IEEE World Congress of Computing Intelligence (WCCI)—and, based on AlphaGo's win against world Go champion Lee Sodol in March, the humans will be having a tough time of it.

Dr. David Fogel of Natural Selection, Inc. says that when considering computer performance, one standard was always "what would a human do?" and that games of skill have often played a role in this evaluation.

Older AI systems were based on codified rules that emulated human behaviour. Today, Fogel says "computer scientists are designing programs that can teach themselves to go beyond human capabilities to 'what would a computer do?'"

In the 2000s, Dr. Fogel designed a program called "Blondie24" that taught itself to play checkers at an expert level. His system used thousands of self-replicating neural networks to train themselves. Equipped with nothing more than board positions, the basic rules, and decision-making skills, Blondie24 used random variation and a "survival of the fittest" approach to learn and improve.

In 2006, Fogel started working on chess, and his "Blondie25" program was the first machine-learning program to defeat a nationally ranked human chess master—as well as "Fritz8," a top-five chess program.

Playing against computers allows humans to confront situations they haven't anticipated and don't automatically know how to respond to. For Go players, this means opportunities to respond to "rare positions" and expand their repertoire of moves in a competition environment. Computer-versus-computer competitions also help computer scientists better understand the strengths and weaknesses of their math-based systems.

With artificial intelligence in a period of accelerated growth, Fogel says that people need to learn more about neural networks, evolutionary computation, and other facets of AI in order to understand "what is possible, plausible or impossible" and to knowledgably check and use results.

Dr. Fogel will be presenting a free, TED-style lecture on the role of games in evolutionary computing at the Vancouver Convention Centre, West Level 1, Ballroom B on Monday, July 25 from 7:00 to 7:30 pm, following the final matches of the Computer-versus-Human Go Competition, taking place from 4:00 to 7:00 pm.

Both events are sponsored by the IEEE and the IEEE Computational Intelligence Society.

Event Details

http://oase.nutn.edu.tw/WCCI2016/poster.htm