The Era of AI and Model-Free Adaptive (MFA) Control

We just entered a great era! Since early 2023, the world has been transformed by ChatGPT, an AI tool that has revolutionized the way we learn from and interact with computers. As a pioneer of AI, I have never been more excited to say that the era of AI has finally arrived. This is a moment we have been waiting for, for more than 25 years!

The development of Model-Free Adaptive (MFA) control technology with artificial neural networks and the introduction of CyboCon, the first MFA control software in 1997, was a pioneering achievement in the field of AI. At that time, the potential of AI was only just beginning to be realized, and the idea of using neural networks to develop advanced control systems was groundbreaking. Now, 25 years later, our dreams of an AI era are finally becoming a reality.

We are currently in the midst of the 4th Industrial Revolution, characterized by the integration of advanced technologies like AI, robotics, and IoT into all aspects of our lives. AI has continued to evolve and advance rapidly, and on the market, MFA has become the only commercially successful smart controller that does not require mathematical models. Due to its smart and general-purpose nature, MFA can make significant contributions in the era of the 4th Industrial Revolution, where smart sensors and controllers are needed for lights-out factories (factories that operate without human intervention), smart equipment, and devices.

Model-Free Adaptive (MFA) controllers have been deployed on a large scale in building control, oil and gas drilling, industrial wastewater pH control, and in almost all industries. In recent years, CyboSoft has made significant efforts to develop and package complete MFA control solutions for specific industrial processes or equipment where there can be multiple control and measurement challenges. These typically have industry-wide problems, including industrial flares, alumina plants, exothermal chemical reactors, tire-making processes, bio-reactors, managed pressure drilling, and semiconductor wafer furnaces. Many of these MFA control solutions have been installed at large scale and are available for new customers to acquire and deploy.

In addition to MFA control, CyboSoft has devoted major resources to R&D of soft-sensors (software sensors) and video object detection AI technologies. The newly awarded US Patent 11,462,089, "Smoke Auto-Detection and Control for Industrial Flares," has significant technical and economic benefits. The smoke auto-detection technology delivered by CyboFlare software uses AI to enable refineries and petrochemical plants to comply with EPA rules at all times to protect our environment. Our soft-sensor and video object detection AI can also be applied broadly in various applications.

In the renewable energy industry, MFA control software has been embedded in CyboEnergy's CyboInverter, a patented and award-winning solar power mini-inverter. Enabled by MFA, the off-grid CyboInverter H model has been widely installed for solar PV water heating. CyboEnergy's battery-less off-grid solar EV charging solution, enabled by its AC assisted off-grid CyboInverter, is poised to play a major role in the transition from gas-fueled cars to electric vehicles.

At CyboSoft, we are always striving to stay ahead of the curve when it comes to technological advancements. As AI continues to evolve and transform industries around the world, we are excited to be a part of this new wave and to contribute to building a better world.

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March 8, 2023
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