GAS LIFT GURUS

Every Well. Every Day.℠
Gas Lift Monitoring & Diagnostic Services

Frequently Asked Questions About Gurus' Use of AI

At Gas Lift Gurus, we use artificial intelligence (AI) to make our pGuru monitoring service even better for your gas-lifted well operations. Below are some common questions and answers about how we use AI.

How is it possible for Gas Lift Gurus to assess every well in a field every day?

Analyzing gas-lifted wells manually takes a lot of time and effort. To make this process much faster, we've developed an AI-based software called pGuru. This software handles the time-consuming tasks, freeing up our gas lift experts – the GURUS – to review the data from every well on a daily basis.

Does pGuru, our AI software, use popular AI tools like ChatGPT or DALL-E?

No, it does not. When people hear "artificial intelligence," they often think of newer tools like ChatGPT. However, AI is a broad field that has been around since the 1950s. pGuru uses a variety of different AI technologies, each specifically chosen to help with different parts of gas lift analysis.

What do you mean by AI technologies?

While ChatGPT, which came out in 2022, has brought a lot of attention (and sometimes controversy) to AI, the field is much older and has given us many useful tools. These include technologies for understanding images, recognizing text and speech, understanding natural language, helping with decision-making, and planning. Think about how Google Maps finds the best route – that uses AI! Similarly, pGuru uses a selection of these AI technologies to tackle the specific challenges of gas lift analysis.

Does pGuru's knowledge base come from the internet?

No. Our gas lift domain experts provide the knowledge incorporated in pGuru.

pGuru is described as an "intelligent" system. Where does pGuru get its gas lift knowledge?

The development of pGuru is a collaboration between our domain experts and software engineers. pGuru automates models and techniques from AppSmiths' WinGLUE software, incorporating expert rules and decision-making.

Does pGuru learn on its own?

No. pGuru is designed to NOT learn independently. Its knowledge is curated by gas lift experts and can be tuned to field conditions through software upgrades.

Does pGuru replace gas lift domain experts?

No. pGuru does not replace people. It is a decision-support tool that assists experts by performing tedious tasks. **pGuru never makes a decision and never takes action on its own.** It identifies problems and makes recommendations, but **experts review and make the final decisions.** This frees engineers to focus on optimization and other challenges.

Our Gurus – and our client's engineers -- review the results for each well and can choose to either accept, modify, or reject the recommendations made by pGuru.

By utilizing Gas Lift Gurus' help with the surveillance, analysis, and remedial recommendations, our client's engineers will finally have time to focus on planning and implementing optimization work on the gas lift wells, as well as investigating things such as valve reliability, well-unloading practices, compressor reliability, metering inaccuracy, well testing strategies, etc. There is never a shortage of challenges in artificially lifted fields.

If pGuru is such good software, why are Gurus needed?

- Gas lift well assessment requires some human judgment because of missing and poor information, or information that is difficult to incorporate, which can vary by field. For example, water cut may be important but uncertain in one field, while another field has to prioritize opportunities based on rig location or wireline risk.

- Software is never perfect. Automating the final 20% of a process may require more than 80% of the effort. Rather than attempting to create the perfect software, we have humans in the loop. The software can still do all the tedious, time-consuming work.

- Humans are better than software at recognizing and accounting for subtleties, particularly in interpreting information from other humans.

- Our gas lift Gurus provide the ultimate quality control of the results we provide to our clients.

pGuru employs several different AI technologies, each selected to address specific problems.

- pGuru presents its results in ways consistent with a gas lift engineer's mental model of problem-solving. The numerous graphs, tables, and charts in pGuru displays are what an engineer would want to see.

- pGuru explains the reasoning behind its analysis and recommendations. The system uses text generation to provide insights into "what the system was thinking" during its analysis of a well.

What was the Pilot's Associate (PA)?

The Pilot's Associate was an AI system developed in the late 1980s and early 1990s to aid fighter pilots by reducing workload and providing decision support. It used multiple AI technologies. DARPA and the US Air Force funded the Pilot's Associate (PA) program to explore the use of artificial intelligence in fighter aircraft. Functionally, the PA system was intended to be a digital back-seater to reduce pilot workloads and provide decision-aiding for complex missions.[1]

What are the key principles of the Pilot's Associate (PA) system, and how do they relate to pGuru?

The Pilot's Associate (PA) was designed to help pilots manage complex situations in the cockpit of a fighter jet. The term associate refers to a human-machine system that grants **full control to the human.** The core guiding principle for the PA was this phrase: **The Pilot is in charge**. The PA software's role was to perform tedious tasks, present information as clearly as possible to users, and make recommendations to the pilot.

One key aspect of the PA was how it presented information. Instead of pilots having to look through many different displays, the PA showed them the information that was most important for their current situation, like defensive maneuvers or long-range attacks. The same principles apply to pGuru.

**The same principles apply to pGuru.
The Human GURU is in charge.**

[1] The PA Program was one of three applications funded through DARPA's Strategic Computing Program. https://onlinepubs.trb.org/Onlinepubs/trcircular/310/310-004.pdf

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