

Klepsydra AI. High performance AI on the edge with low power consumption

Klepsydra AI is a high performance deep neural network engine for edge computers. Customers can deploy existing or new trained models on the edge using Klepsydra AI, in the same manner as with standard edge AI solutions. Klepsydra AI offers three main benefits:

- Process up to 6x more data with AI
- Reduce power consumption
- Compatible with main providers of AI software.

Klepsydra AI has been inspired by high frequency trading technologies and the performance tests show that it outperforms TensorFlowLite and OpenCV in both processing speed and power consumption.

Core benefits

Safety and reliability.

- **Real-time edge AI.** Klepsydra AI can process data in real-time with low latency.
- **Predictable edge AI.** Klepsydra AI is substantially more stable, predictable and deterministic than other edge solutions.

Cost.

- **Less hardware cost.** With Klepsydra AI, more data can be processed on the same hardware, with less power and less memory and without any cloud computing support.

Compatibility.

Klepsydra AI is compatible with most AI formats and AI software solutions. It also accept input data in a variety of formats including images and time series.

Furthermore, Klepsydra can be deployed to several edge computers including, but not limited to, Odroid XU4, RaspberryPi4, Intel NUC, etc.

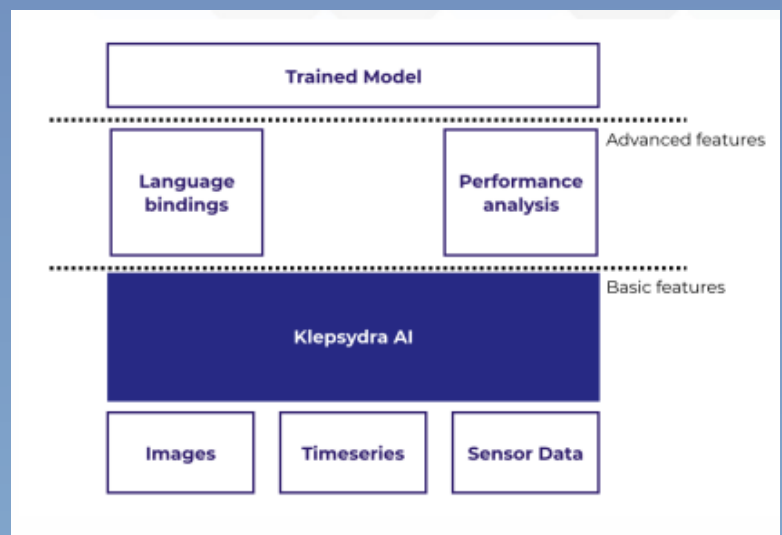


Figure 1. Klepsydra AI setup

Applications

Klepsydra AI can deploy on the edge pre-existing or new models that customers might have developed and trained. Klepsydra AI is used in a large variety of applications including:

- Autonomous robotic vision based navigation
- 3D model analysis of infrastructures in real-time
- Surveillance and security
- Pose estimation and relative navigation
- Data quality check.
- Etc.

Overview

Klepsydra AI is an inference engine for Deep Neural Networks (DNN) aimed at Edge computing applications.

Klepsydra AI has the following modules and APIs:

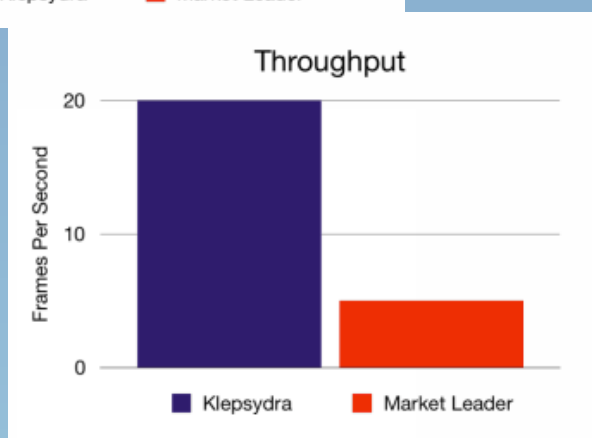
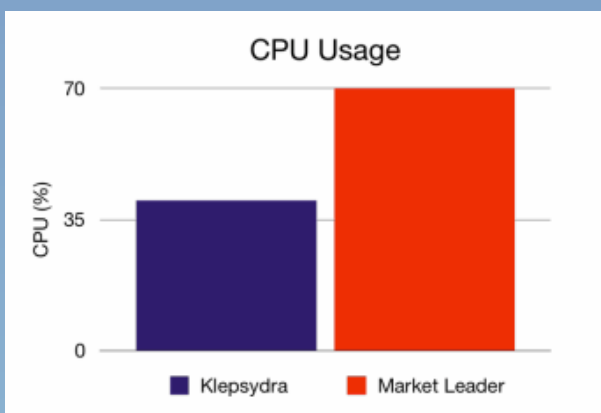
- Application API. The inference API that includes instantiation of the model and asynchronous inference API, i.e., callback API.
- Model importer API.
- Performance configuration module. This model allows fine performance autotuning of the AI model deployment.

Core features

Klepsydra has three main core features:

- 2x to 6x increase in data processing capabilities with respect to standard techniques (e.g. OpenCV and TensorFlowLite)
- 30%-50% less power consumption with respect to standard techniques.
- Accepts ONNX, TensorFlow and Caffe models.

Figures 2 and 3 correspond to a benchmark comparing Klepsydra AI with TensorFlow Lite in a Dual core ARM cortex A9 (OS Linux).



Requirements

Klepsydra is platform independent with the following technical requirements:

- Operating system present in the target computer
- Target computer with atomic operation set
- C++11 compiler for the target computer
- Vectorization.
- Eigen3 and ONNX software packages.

Klepsydra is supported in a growing number of platforms including:

- Operating system: Linux, FreeRTOS, PikeOS.
- Processors: ARM (V8, Cortex A7, Cortex A9), x86 64 and 32 bits.
- Minimum RAM usage: 250Mb
- CPU usage: [15% - 50%]
- Disk Space: 10Mb

Compatibility features

- Supported languages: C++, C, NodeJS, Python
- Data format: Float matrices, time series and OpenCV matrix objects (cvMat)
- Model format: ONNX, TensorFlow and Caffe.

Trial request

In order to request a trial version, send an email to sales@klepsydra.com or go to the website [download](https://www.klepsydra.com/download/) section <https://www.klepsydra.com/download/>

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