



Project ESAX

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Jacopo Credi

Co-founder and VP of AI



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About Axyon AI

Axyon AI is an Italian fintech company on a mission to **bring automated machine learning technology to investment management**

4.3

Years
old

79%

Employees with a
tech background

11

Research
projects

168 k

GPU hours
per year (est.)

Investors



Partners



UNIMORE
UNIVERSITÀ DEGLI STUDI DI
MODENA E REGGIO EMILIA



NVIDIA



Microsoft

Latest awards



Technology

Axyon IRIS®

Client-facing application delivering AI-powered investment strategies to asset managers, hedge funds and corporate trading desks

Axyon AI Platform

Automated AI model development platform for data scientists and ML engineers, optimized for time series data

← ESAX

Industry-standard frameworks

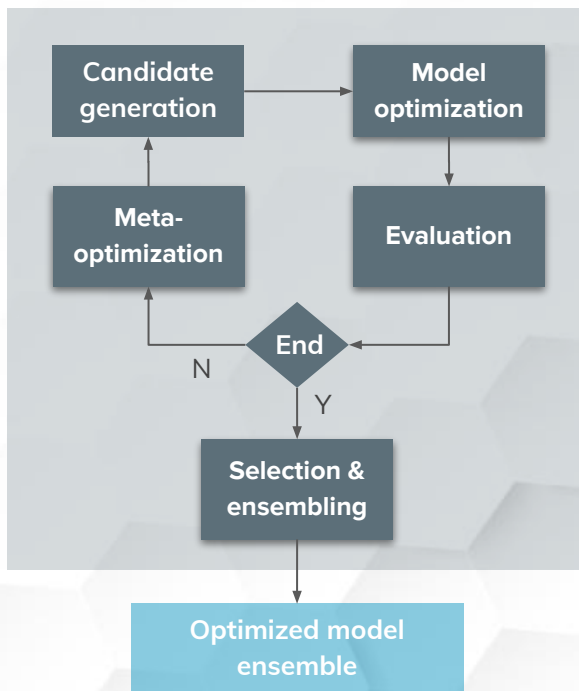
State-of-the-art frameworks for ML/DL, data science, containerization, web development



Project ESAX

Motivation

- The Platform **streamlines the entire AI development process**, incl. hyperparam. optimization and feature selection using Evolutionary Computation methods
- The Platform relies on a **workload management system** natively supporting hybrid HPC and cloud (provider-agnostic) clusters
⇒ See Annex



75% Overall level of automation

7x Productivity improvement per employee

5k GPU hours for a typical AutoML run

⇒ We need to scale!

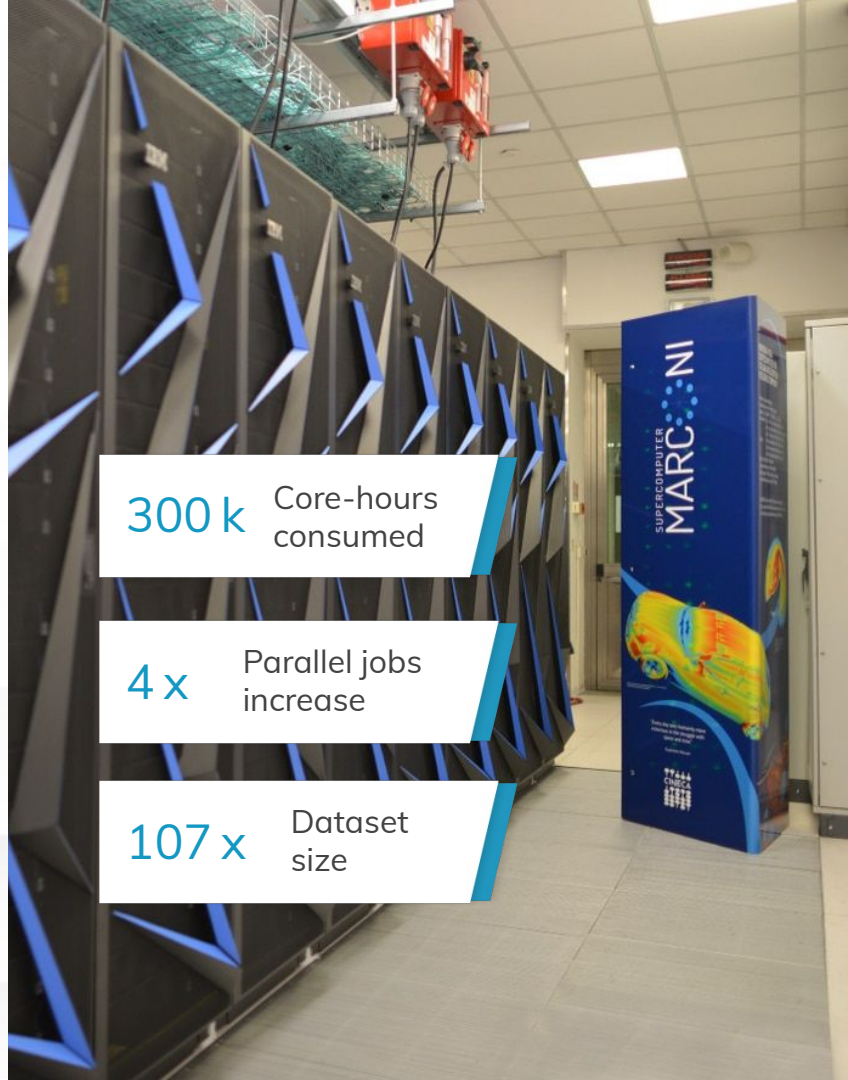
Project ESAX

Resources used and support received

- Access to CINECA HPC Tier-0 system **Marconi100**
 - 980 IBM POWER9 nodes
 - 4x Nvidia v100 GPUs per node
 - Currently rank 11 in global TOP500
- Support by CINECA **HPC specialists**

Achievements and impact

1. Improved **per-job parallelization**, by enabling multi-GPU and multi-node distributed training (Horovod + Tensorflow 2.X)
2. Further **improved workload management system** to handle a larger number of jobs, with larger datasets, with no I/O or network issues



300 k Core-hours consumed

4 x Parallel jobs increase

107 x Dataset size

Project ESAX

Contributors



Riccardo Folloni
Lead Machine
Learning Engineer
Axyon AI



Fabio Franzoso
Head of
Engineering
Axyon AI



Eric Pascolo
HPC Consultant for
Industrial Application
CINECA



Roberto Da Vià
HPC Consultant for
Industrial Application
CINECA



Jacopo Credi
Co-founder
and VP of AI
Axyon AI

Contacts



via Rainusso 144

Modena, Italy

axyon.ai

Annex

Success stories

Multi-asset portfolio optimisation

AI-powered **multi-asset and forex** overlays for long/short tactical asset allocation since 2018

 NIKKO GLOBAL WRAP

Commodity trading

Working with **energy company** to provide AI-generated alpha on commodity strategies

1.12 sharpe

Equity long / short

Working with several **hedge funds** to provide high-performing **equity** long/short models

2.08 sharpe overlay

Forex tactical overlay

AI-powered, **futures-based forex overlay** for multi-asset tactical allocation

0.85 sharpe overlay

Market anomaly detection

Reduced anomalies in **option pricing** data for regulatory purposes



94% accuracy

CO2 trading

Working with **energy and utility** companies to assist intraday CO2 trading with AI models

1.40 sharpe

Annex

Axyon Workload Management System

- Scalable and flexible DB-centric master-slave system architecture
- Leverages any connected internal (**on-premise**) or external (**HPC or cloud**) computational nodes
- Particular focus on **flexibility, reliability and data security**
- Designed, developed and maintained by Axyon, improved through research projects with HPC specialists from CINECA (whitepaper available on the [PRACE-SHAPE portal](#))

