# intellegens

DATA-DRIVEN DISCOVERY

## Machine learning for additive manufacturing - Project MEDAL

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# Introducing Intellegens


Unique **deep learning** software and expertise - Alchemite™

- Get value from **sparse, noisy data** to solve complex **high-dimensional** problems

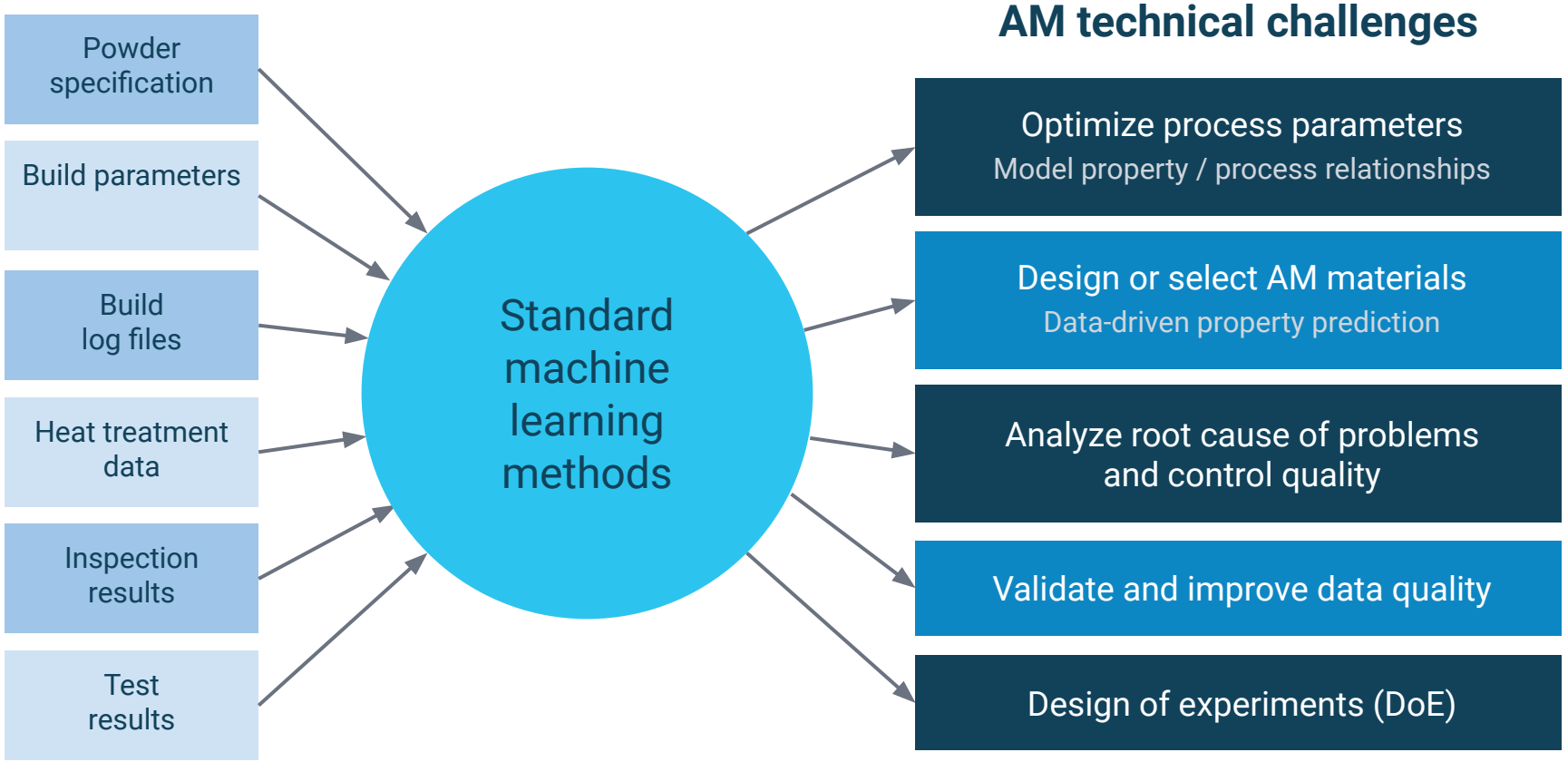
Easily deploy models to deliver **immediate ROI**

- Integrate with existing systems and/or use through web-based platform

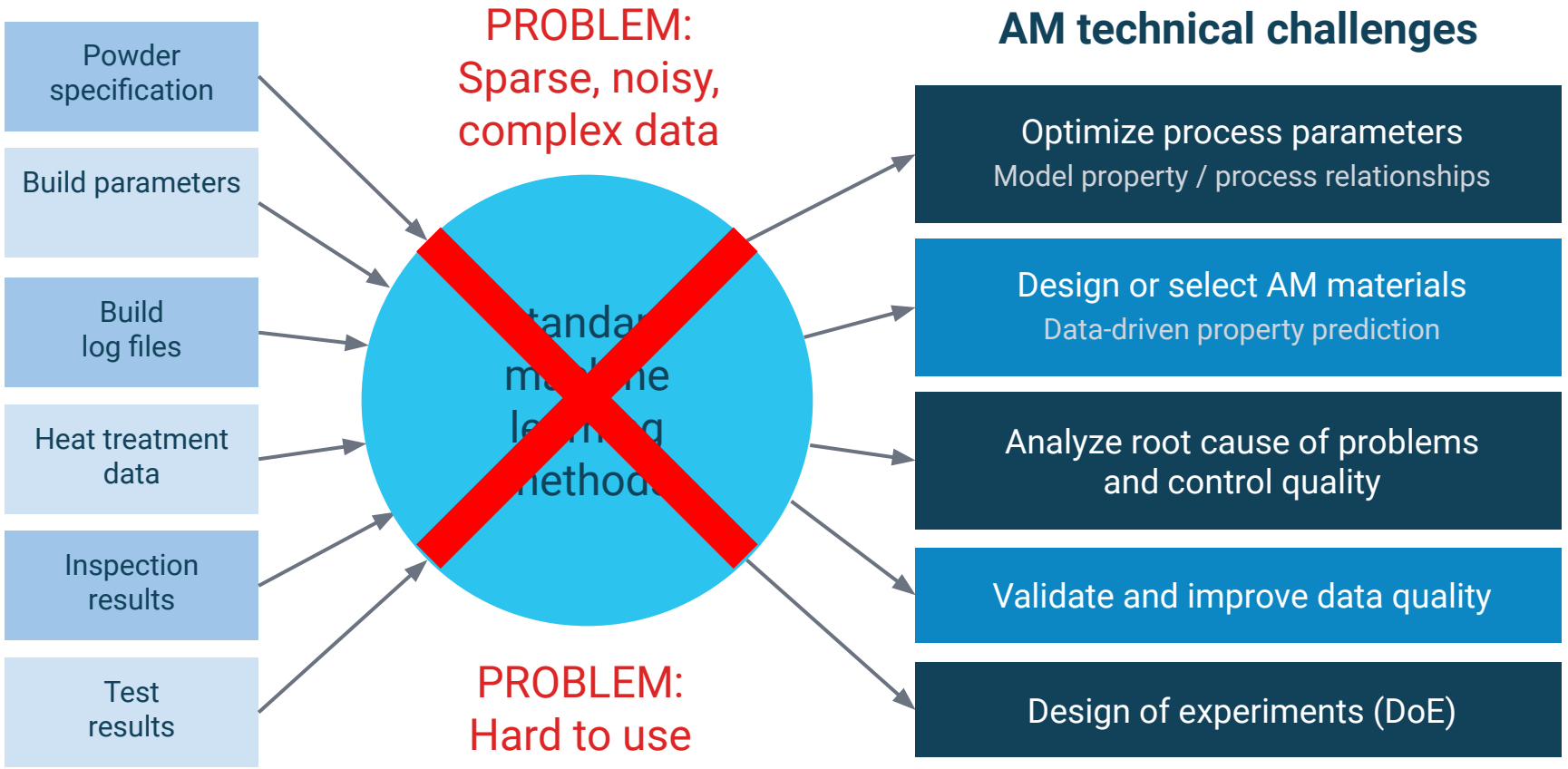
Can be applied to any **numerical dataset**

- Key focus areas: materials, chemicals, drug discovery, manufacturing

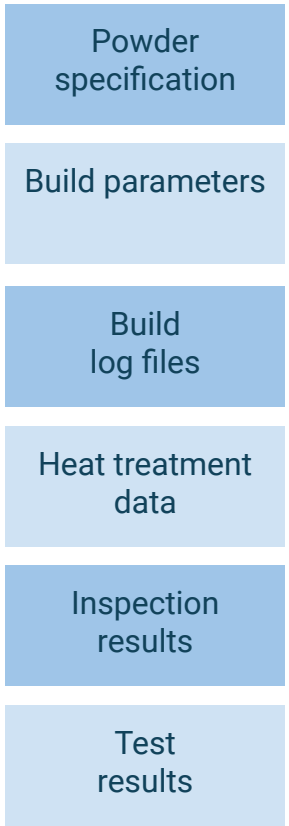
# Can we use machine learning in AM?



# Challenges with Machine Learning in AM



# Why is AM project data sparse and/or noisy?




**Because it is real-world data:**

You cannot test every build for every property

Supplier or legacy data is incomplete or inconsistent

You are combining data from different sources or projects

- Projects with different goals test different properties

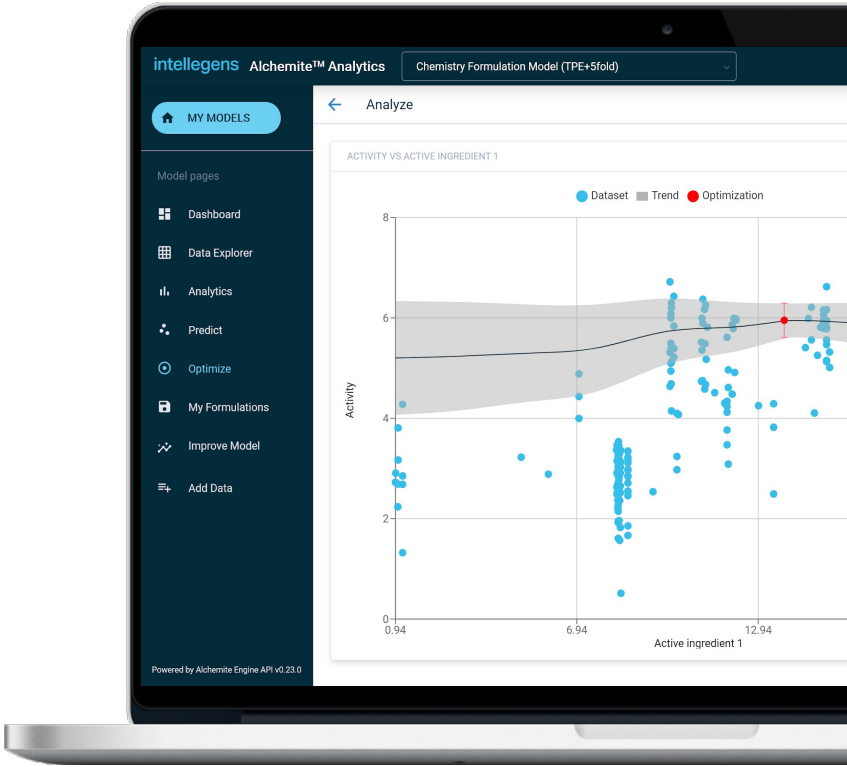
Variability of processes, machines, labs, and operators

# Alchemite™ technology offers a unique combination

Value from sparse, noisy data

Optimise against multiple targets

Quantify uncertainty to enable rational decisions



# Project MEDAL

*Machine Learning for Additive Manufacturing Experimental Design*

NATEP

intellegens

The University Of Sheffield. AMRC Advanced Manufacturing Research Centre

BOEING

"Applying machine learning technology to make the AM process of metallic alloys for aerospace cheaper and faster, encouraging production of lightweight, energy-efficient aircraft to support net zero targets for aviation."

# Project MEDAL technical focus

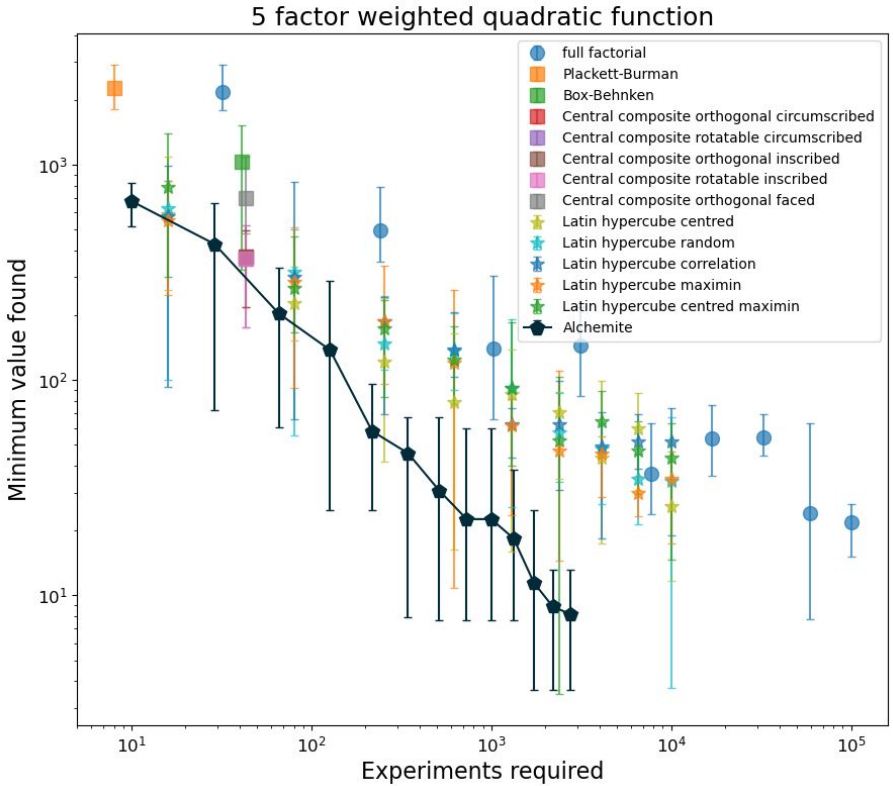
Focus on Laser Powder Bed Fusion (LPBF) methods for metal AM

Dramatically reduce experiments required to identify the right process parameters

Use Alchemite™ machine learning to guide its test program

Enable manufacture of high density, high strength parts

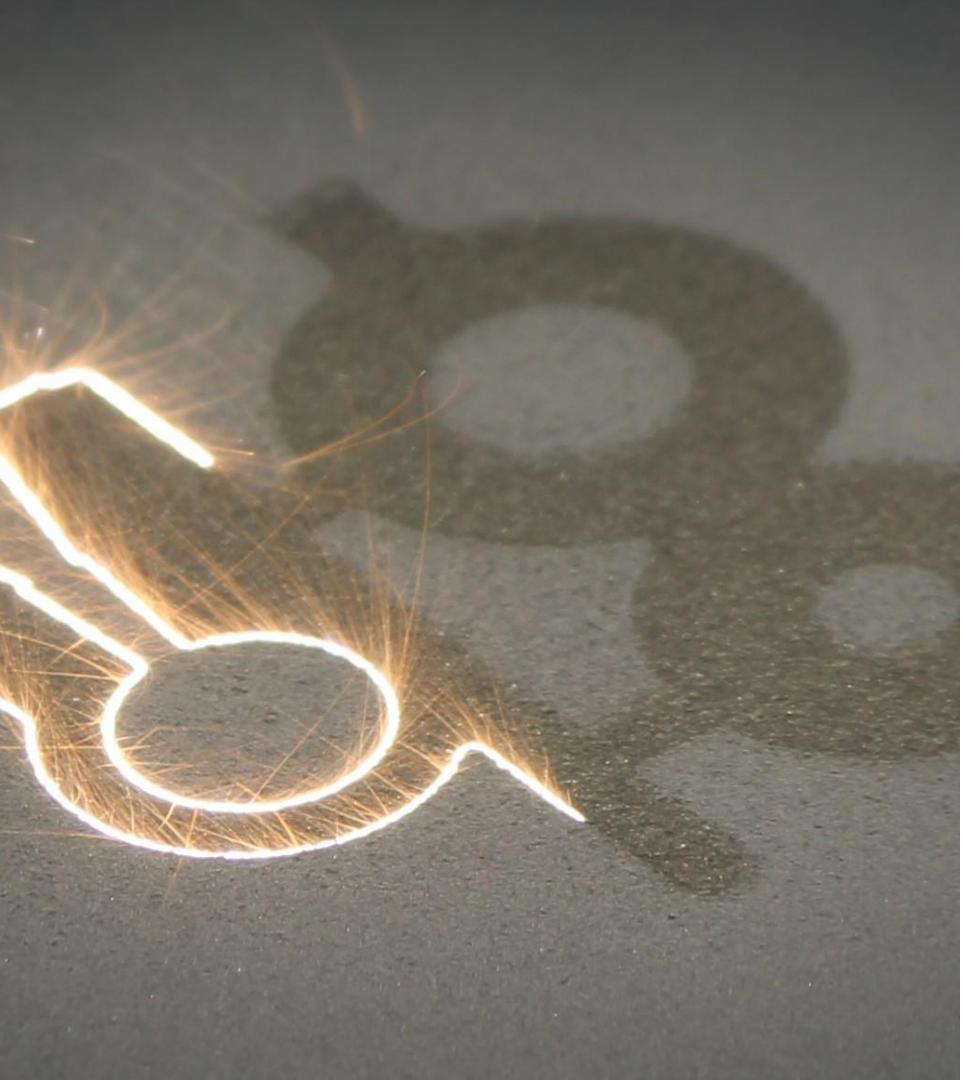
# Project MEDAL




*"Alchemite™ was able to converge on the optimum solution with far fewer experiments"*

Ian Brooks

Technical Fellow, AMRC



# Machine learning for additive manufacturing

**A data-driven approach to**

Improve AM materials

Ensure reliable, repeatable AM processes

Reduce cost and time to market


**Website** https://intellegens.ai

**Contact** gareth@intellegens.ai