Improve efficiency by utilizing AI/ML in AVEVA™ E3D Design

Brett Parker

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Goal

Why are you here?

- Machine Learning awareness
- Education
- Machine Learning in AVEVA E3D Design
- Exciting new features
- Inspiration
- Spread the word

Agenda

Introduction

Machine Learning concepts and terminology

What AVEVA E3D Design is doing

Take a look at what we have done

Future of AVEVA E3D Design

Take a look at what is coming

Q&A

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Artificial Intelligence

AVEVA and AI

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Artificial Intelligence

Artificial Intelligence is disrupting industrial markets and forcing enterprises to re-evaluate how traditional work is performed such as:

- Workforce training
- Engineering and design
- Maintenance and repair
- Operations forecasting and scheduling

AVEVA's industry leading cloud-based AI technologies mitigate business and operational risk, improve workforce safety and efficiency, and forge a more reliable and sustainable enterprise.

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INTRODUCTION

Machine Learning

What is it? When do we want to use it?

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Programming the unprogrammable

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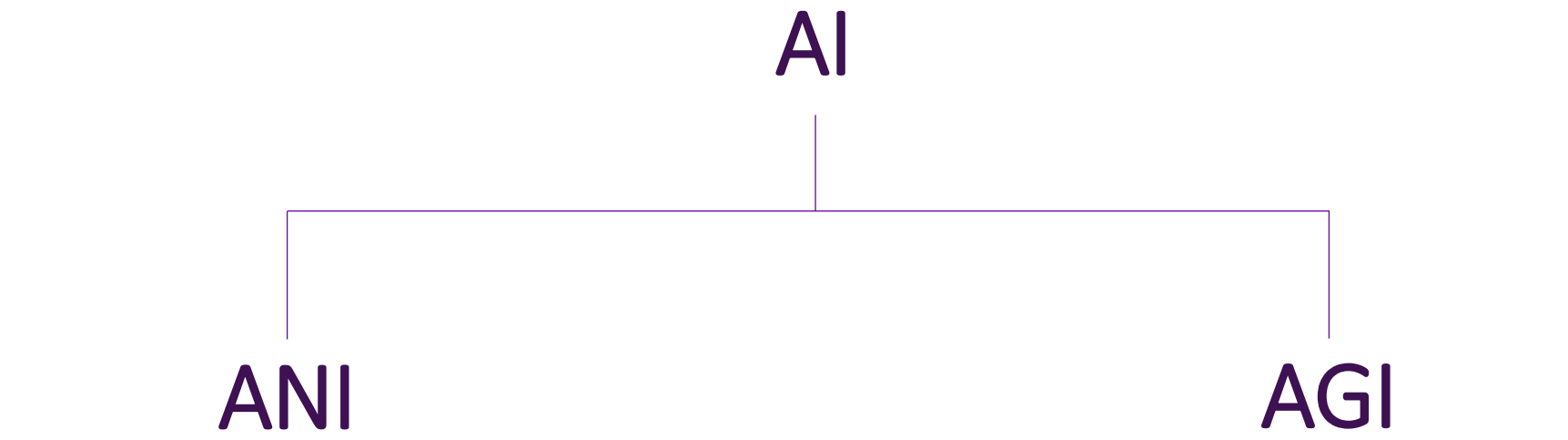
Demystifying AI



Artificial Narrow Intelligence

E.G Smart speaker, self driving car,

web search. Single use intelligence.

Artificial General Intelligence

Do anything a human can do.

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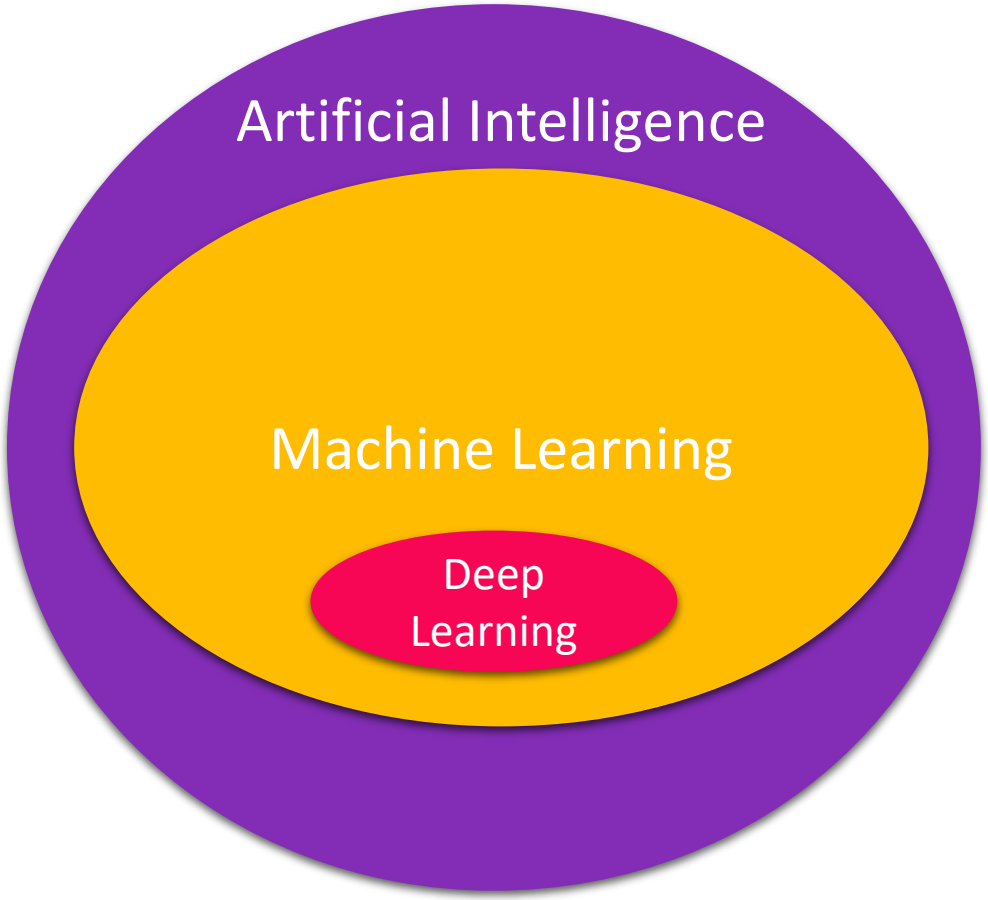
AI, ML and DL

Artificial intelligence, Machine Learning and Deep Learning



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Machine Learning

Data

Training

Model

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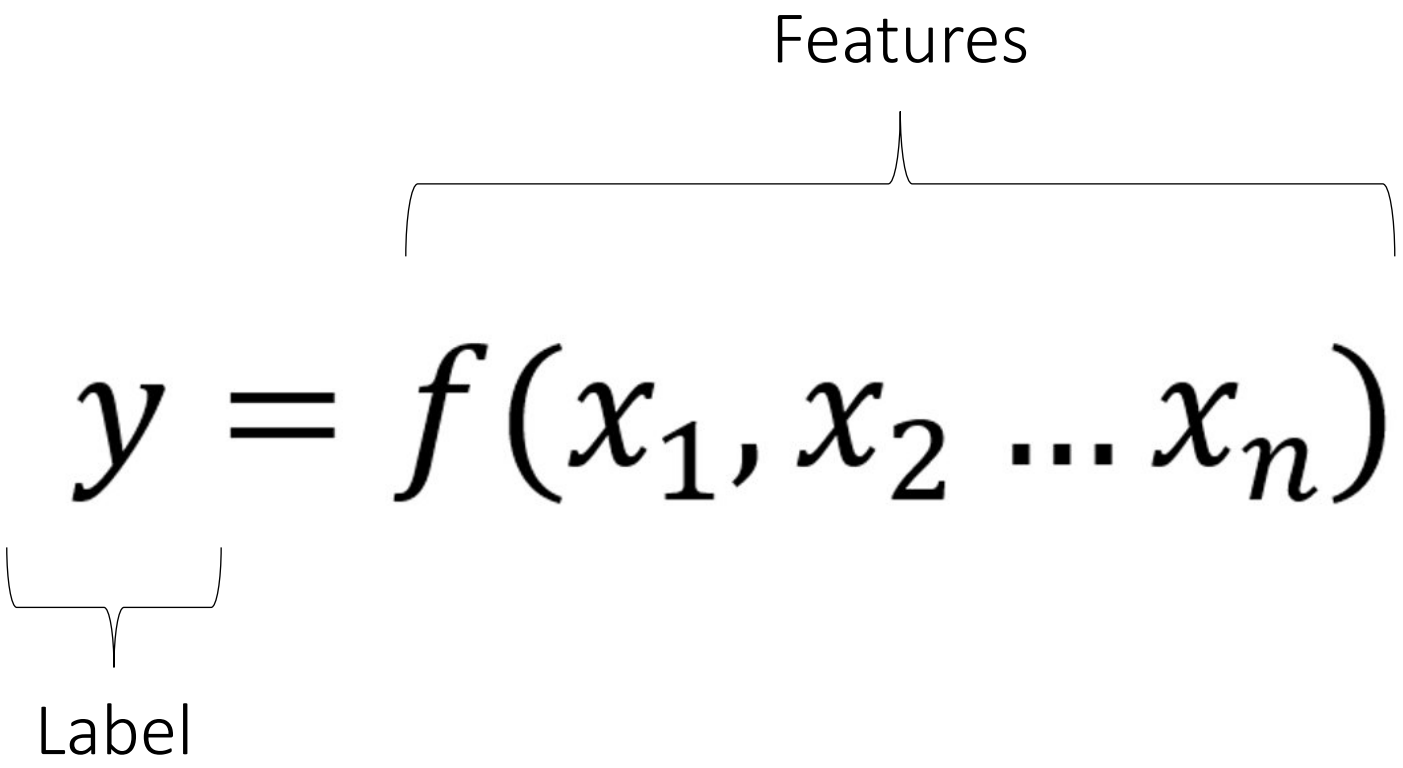
What is a model?



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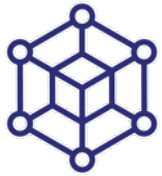
TYPES

Machine Learning

Supervised Learning

Use of **Labels**, e.g. Regression, Binary Classification, Multi-class Classification



Unsupervised Learning

No Labels, e.g. Clustering, PCA, Anomaly Detection

Reinforcement Learning

Rewards and Penalties. Finding a balance between exploration and exploitation.

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“Data Science produces Insights

Machine Learning produces Predictions

Artificial Intelligence produces Actions”

David Robinson, Chief Data Scientist at DataCamp

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Bringing AI/ML to AVEVA E3D Design

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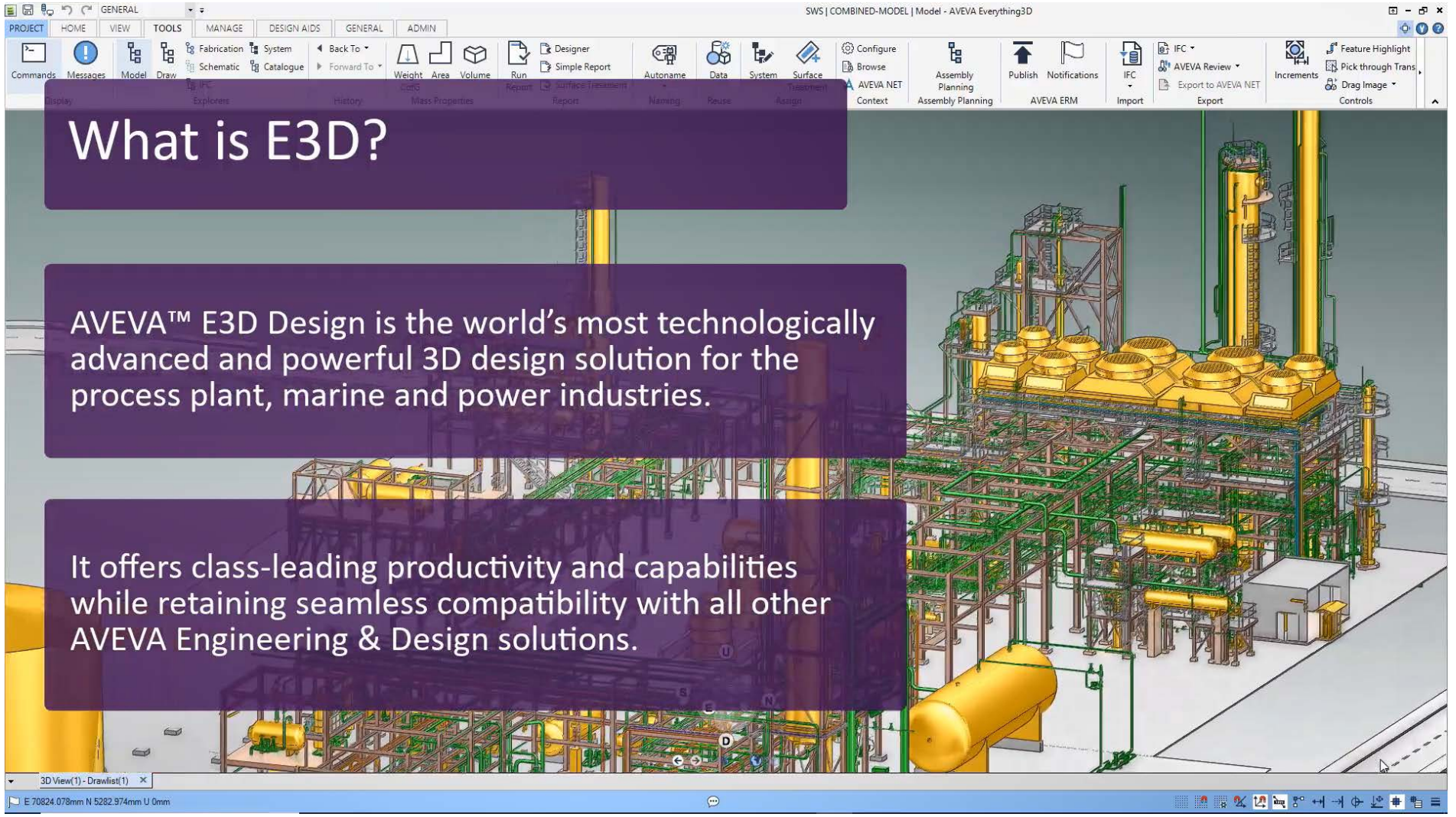
What is AVEVA E3D Design?



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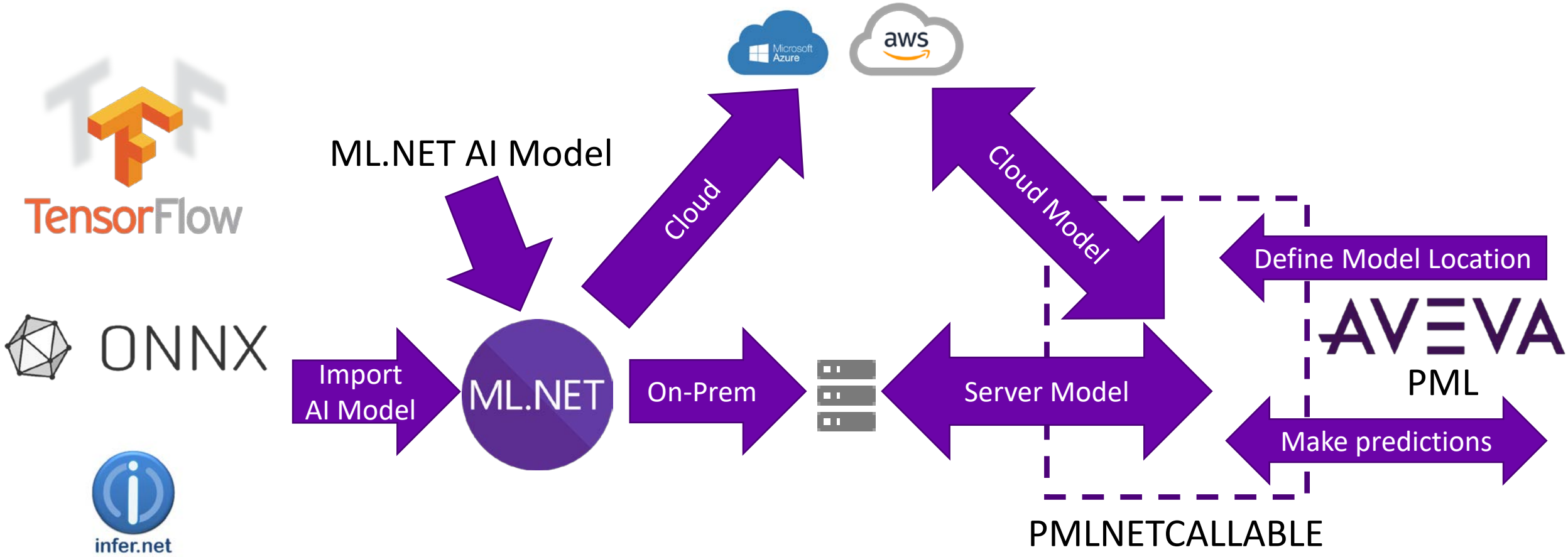
AVEVA PMLNETCALLABLE – Microsoft ML.NET



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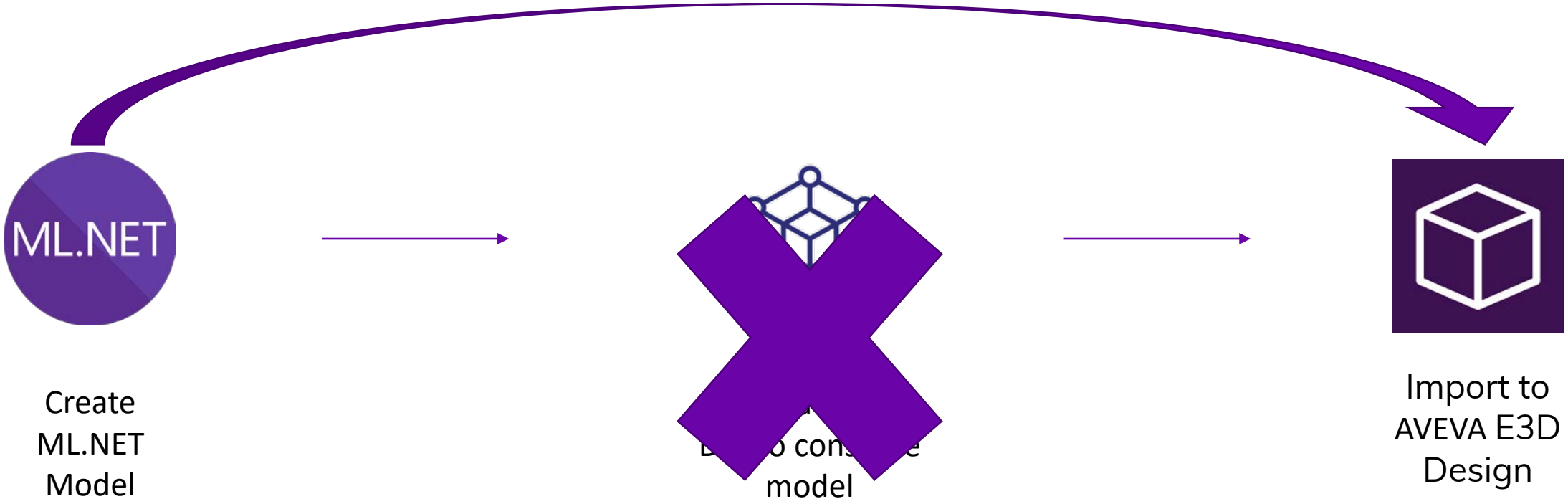
Microsoft ML.NET Creation

What you can do today



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ARTIFICIAL INTELLIGENCE

Machine Learning in AVEVA E3D Design

The future

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AVEVA E3D Design – Artificial Intelligence Methodology

Workflow enhancement

What we have

How does it work today?

Users

What do our users have to do?

Benefit

How can we make the workflow more streamline?

First Principles AI

Problem to solve

What are we trying to solve?

Challenge

How do we know this is true?

Benefit

How can we deliver an innovative auto generative design solution?

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AVEVA E3D Design - Structural size prediction

Potential Feature

Workflow enhancement

What we have

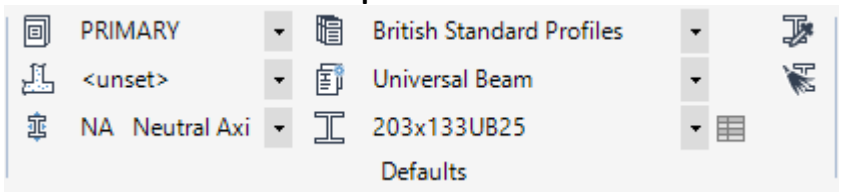
Defaults tab requires manual structural size selection

Users

Multiple button clicks

Benefit

Workflow and repetitive tasks reduced



First Principles AI

Problem to solve

Consistency, accuracy, cost effective, sustainable steelwork

Benefit

Automatically create full structural frames and racks

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AVEVA E3D Design – Pipe Support prediction

Potential Feature

Workflow enhancement

What we have

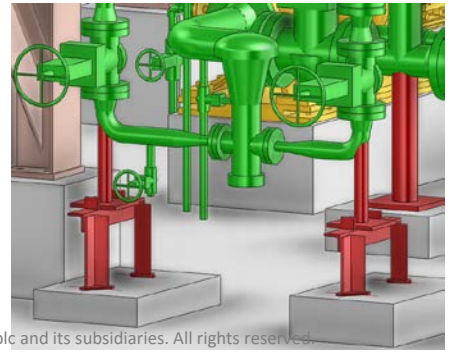
Support form with several buttons

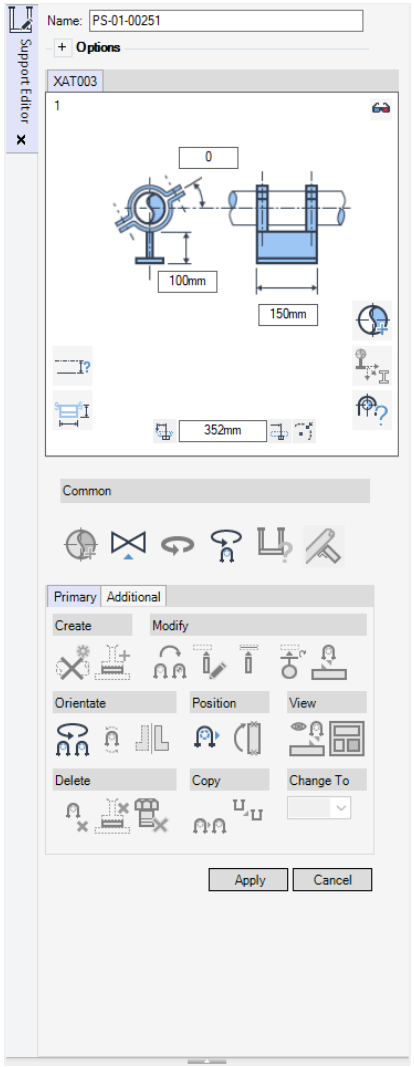
Users

Multiple button clicks

Benefit

Workflow and repetitive tasks reduced





First Principles AI

Problem to solve

Consistency, accuracy, cost effective, sustainable supports

Benefit

Automatically create pipe support elements without any user input

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AVEVA E3D Design – Solar panel prediction

Potential Feature

Workflow enhancement

What we have

Manual creation

Users

Multiple workflows, multiple button clicks

Benefit

Workflow and repetitive tasks reduced

First Principles AI

Problem to solve

Consistency, accuracy & sustainability during detail design

Benefit

Automatically predict and determine the correct number of solar panels required for the problem

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THE FUTURE

Artificial Intelligence

Embrace AI and all that it brings

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“Robots are not going to replace humans, they are going to make their jobs much more humane. Difficult, demeaning, demanding, dangerous, dull – these are the jobs robots will be taking.”

Sabine Hauert, Co-founder of Robohub.org

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