MONOLITH

Pricing modules

An introduction to the content and benefits of each of our modules

Aptargroup BMW L'ORÉAL SIEMENS

HONDA McLaren NASA AIRBUS Honeywell
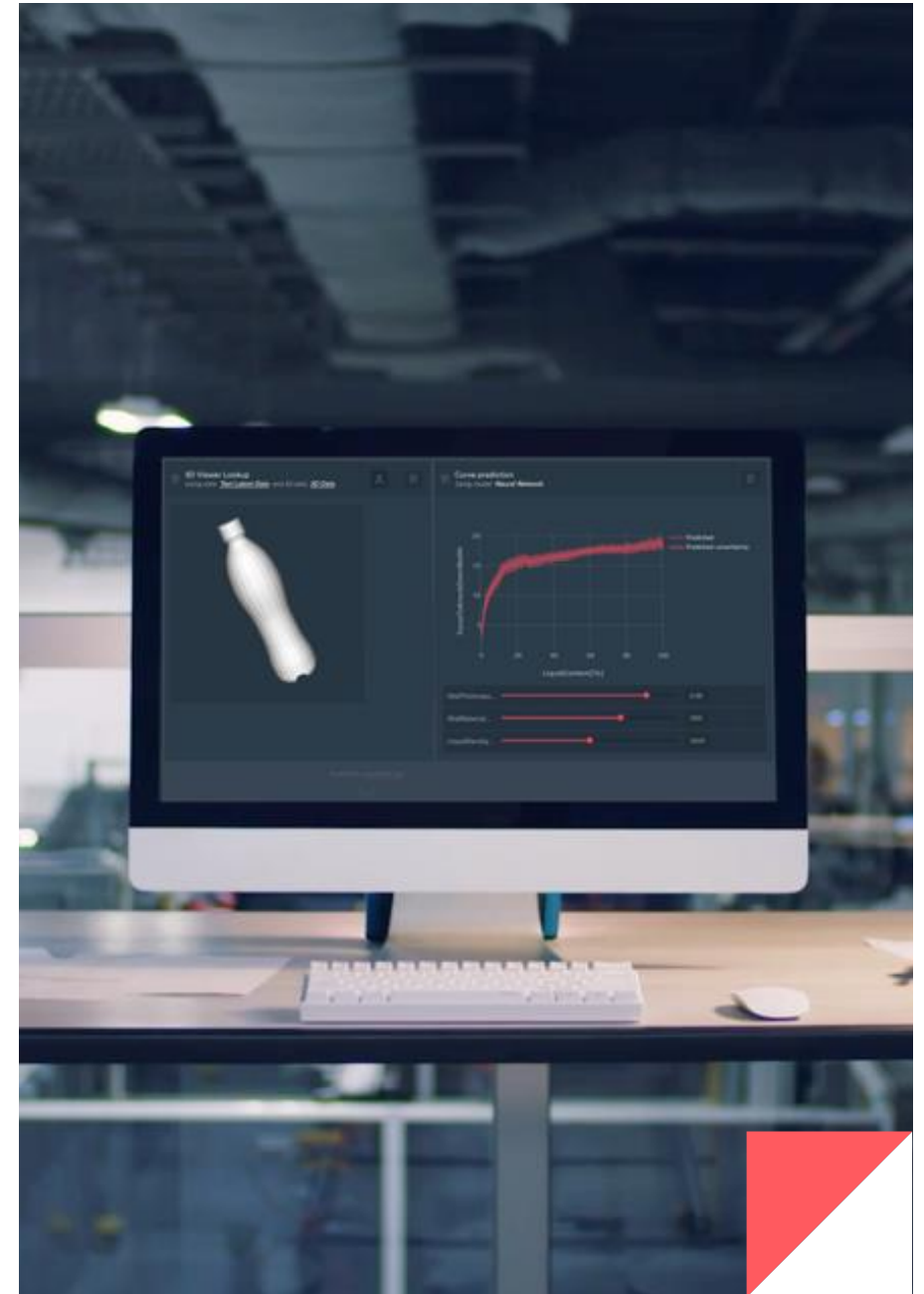
Monolith's modular structure

01

Core Module

02

Collaboration Suite

Create and manage teams within the platform. Have control over which users can view and edit work. Collaborate by sharing data, and notebooks and results.

03

3D Deep Learning

Get access to our proprietary machine learning models developed specially to learn from 3D designs and simulations.

04

AI Optimisation

Utilise your machine learning models to find optimal designs from your machine learning models based on a set of goals and constraints.

05

Guided and Automated Machine Learning

Use our suggestions of the best AI models to use to fit your requirements, including accuracy and training speed.
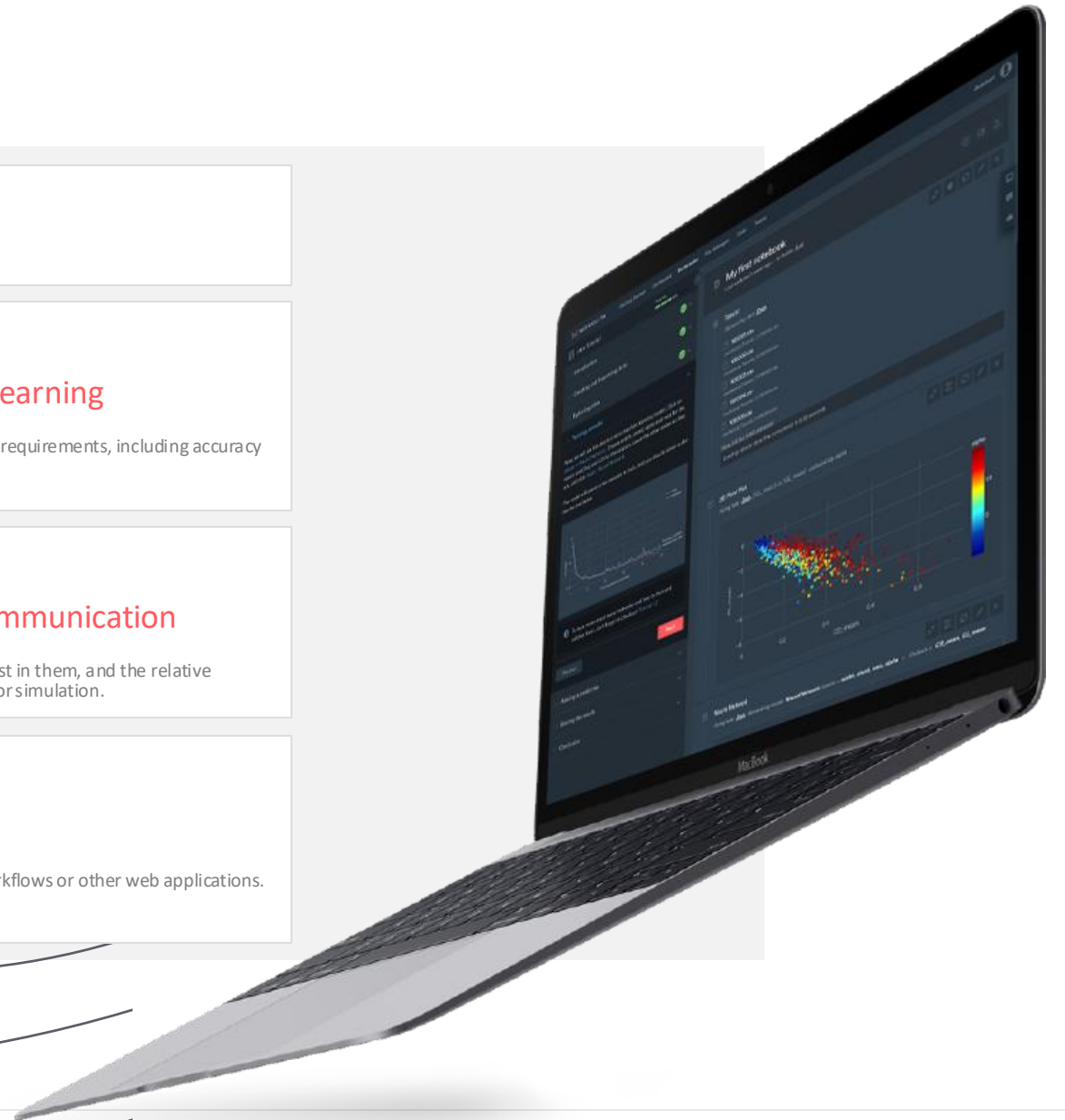
06

Explainable AI and Uncertainty Communication

Quantify the uncertainty of predictions to increase your trust in them, and the relative importance of different variables on the outcome of a test or simulation.

07

SDK / API Integration

Implement a link between the platform and the client's workflows or other web applications.

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monolithAI.com

Core Module

Import/Export

Monolith supports all major open-source file formats for both tabular and 3D data.

Data exploration/visualisation

Our data visualisation tools help you explore/understand your data and communicate your results.

Data transformation

Data processing is an integral part of building a machine learning pipeline. It enables you to structure and enhance your data in preparation for training.

Data modelling

Monolith has made the daunting task for building machine learning models accessible to any engineer.

Model evaluation

To build trust in your models and compare different models, Monolith has a host of tools to evaluate accuracy and validate predictions.

Prediction

Once you've built an AI model, you can use it to make instant predictions for the performance/quality of a new design tested under new conditions.

Tutorials

Our interactive tutorials will help you get familiar with the functionality of our platform in an engaging way.

Dashboards

Interactive dashboards allow you to share your results in a way which makes them interpretable and reusable by your colleagues or clients.

File management

Easily upload your raw datasets to the cloud.

Data and model management

Easily share processed/predicted data and models with your colleagues in order for them to use them in their own workflows.

Custom Code

If you're familiar with Python, you can write your own data transformation code from within a notebook.
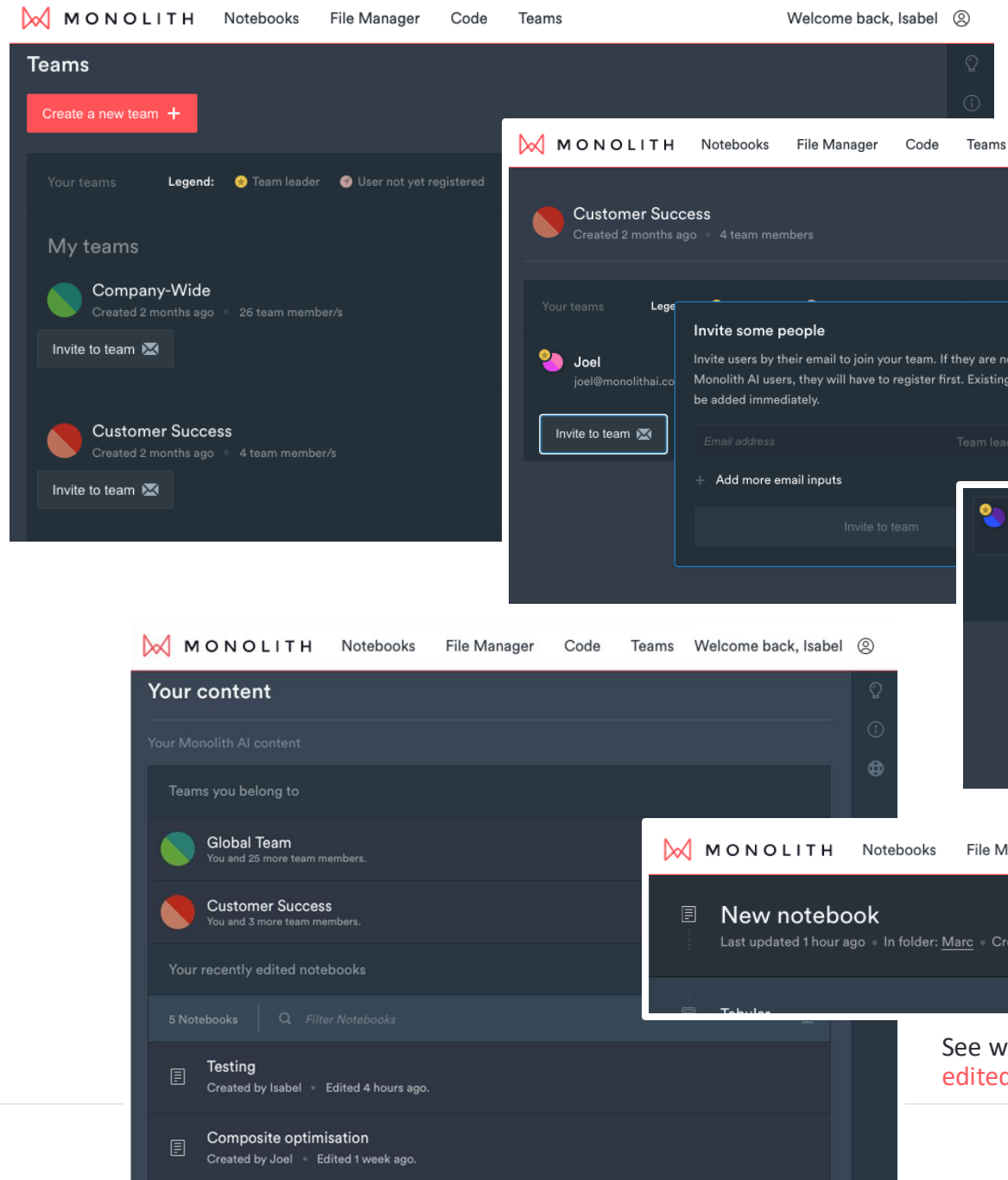
Collaboration Suite

Team management

With the Collaboration Suite, you can create new teams to organise the data stored on the platform and the workflow of each team using the folders and notebooks. Company-Wide is the default team from the core platform.

Permissions management

Assign admins / team leaders, who are capable of adding or removing team members and archiving teams.

Privacy

Isolate the data, models, notebooks, dashboards of one team from other platform users. Only members of the team can access their team folder area where their teams' notebooks, dashboards and models are stored. Only members of the team can access their team File Manager area where their teams' data is uploaded.

MONOLITH — Notebooks · File Manager · Code · Teams — Welcome back, Isabel

Teams

Create a new team +

Your teams · Legend: ★ Team leader · ⊘ User not yet registered

My teams

Company-Wide
Created 2 months ago · 26 team member/s
Invite to team ✉

Customer Success
Created 2 months ago · 4 team member/s
Invite to team ✉

MONOLITH — Notebooks · File Manager · Code · Teams

Customer Success
Created 2 months ago · 4 team members

Your teams · Lege

Joel
joel@monolithai.co...
Invite to team ✉

Invite some people

Invite users by their email to join your team. If they are not yet Monolith AI users, they will have to register first. Existing users will be added immediately.

Email address · Team leader? ☐

+ Add more email inputs

Invite to team

From within the platform, send email invitations to register and login to join a team.

Isabel
isabel@monolithai.com

Isabel
isabel@monolithai.com

Joined team 0 seconds ago.

Demote team leader

Remove from team

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Your content

Your Monolith AI content

Teams you belong to

Global Team
You and 25 more team members.

Customer Success
You and 3 more team members.

Your recently edited notebooks

5 Notebooks · Filter Notebooks

Testing
Created by Isabel · Edited 4 hours ago.

Composite optimisation
Created by Joel · Edited 1 week ago.

MONOLITH — Notebooks · File Manager · Code · Teams

📄 **New notebook**
Last updated 1 hour ago · In folder: Marc · Created by: Marc Emmanuelli · Last Updated by: Marc Emmanuelli

See who created and lasted edited notebooks.

3D Deep Learning

Scan a 3D design and predict its performance.

Learning from 3D data

Our 3D Deep Learning algorithms (Autoencoders) enable you to automatically parameterise a dataset of historic 3D designs. This means Monolith can recognise the 'DNA' which characterises your designs, and encode this information in order to correlate it to performance attributes.

Generative design

Using this 3D parameterisation, you can also generate new designs which share 'DNA' with your historic designs. Coupled with AI Optimisation, this will enable you to generate new, performance-optimised 3D designs.

3D simulation fields

Monolith enables you to predict single scalar values from your simulations, but also entire 3D fields of data. This means you can investigate the local effects of design changes to temperature fields or pressure fields, for example.
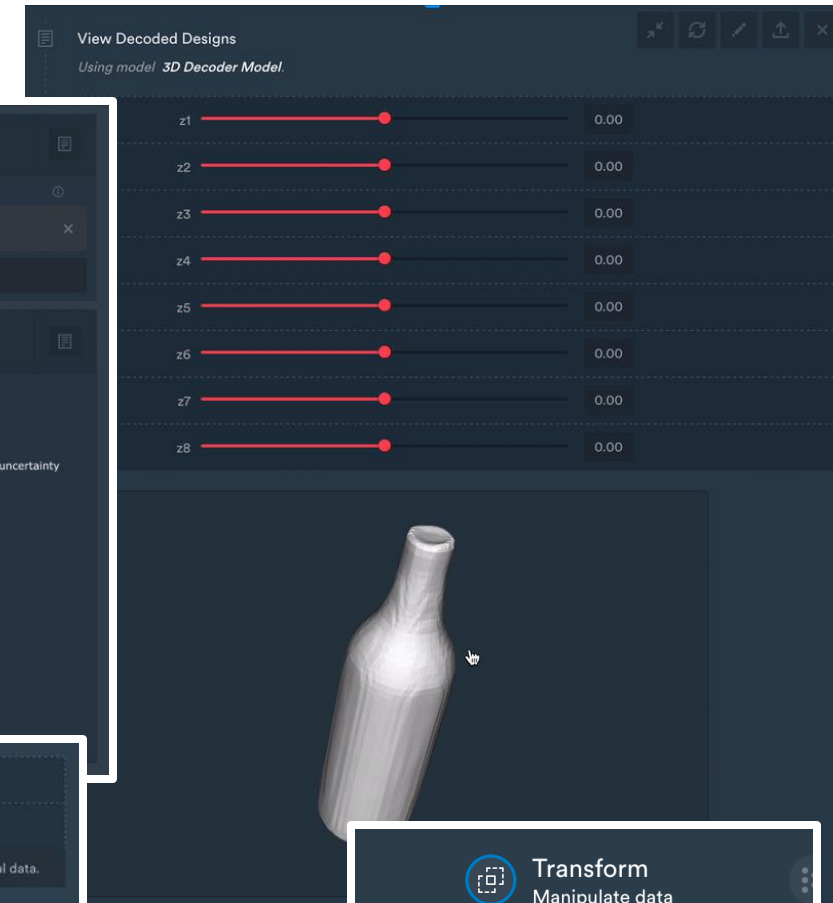
3D data processing

Monolith has a host of data transformation tools to pre-process or post-process your 3D data.
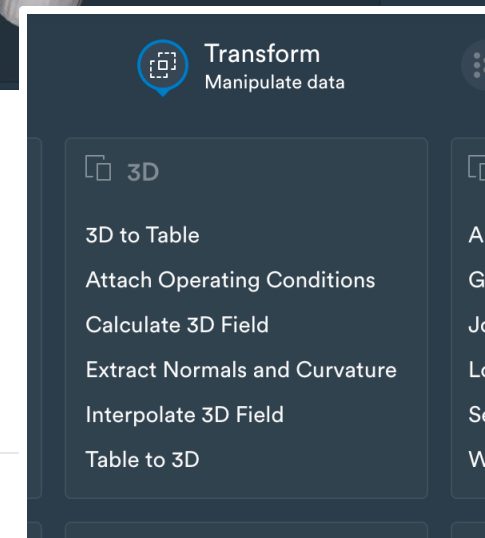
Predict entire 3D fields of data.

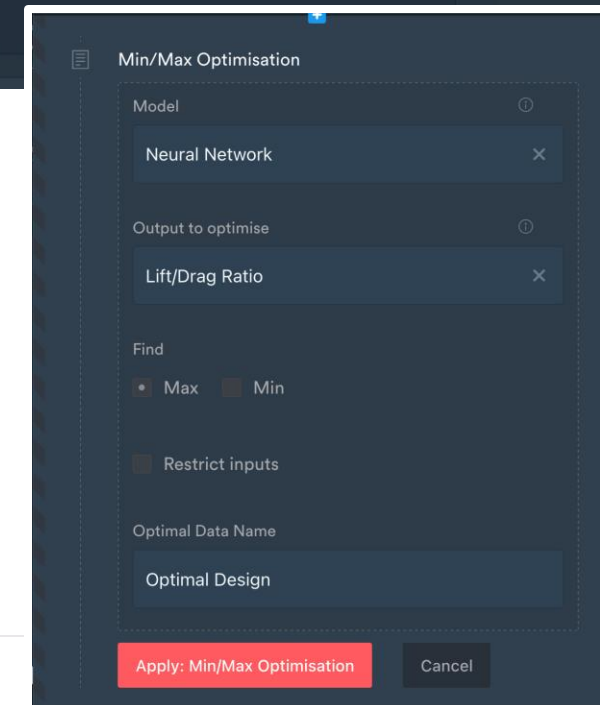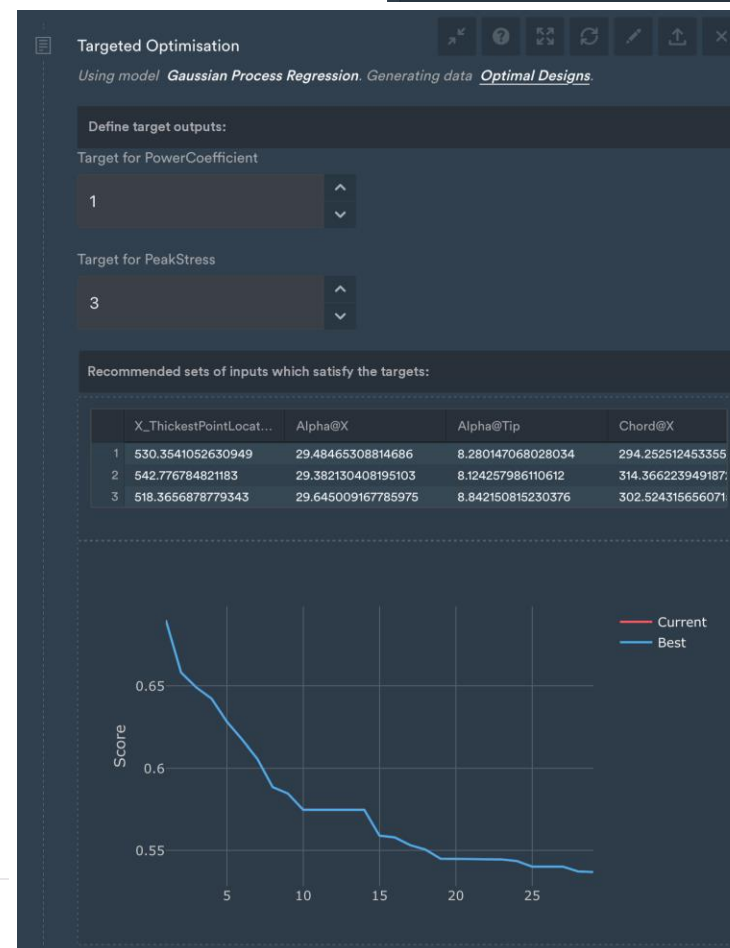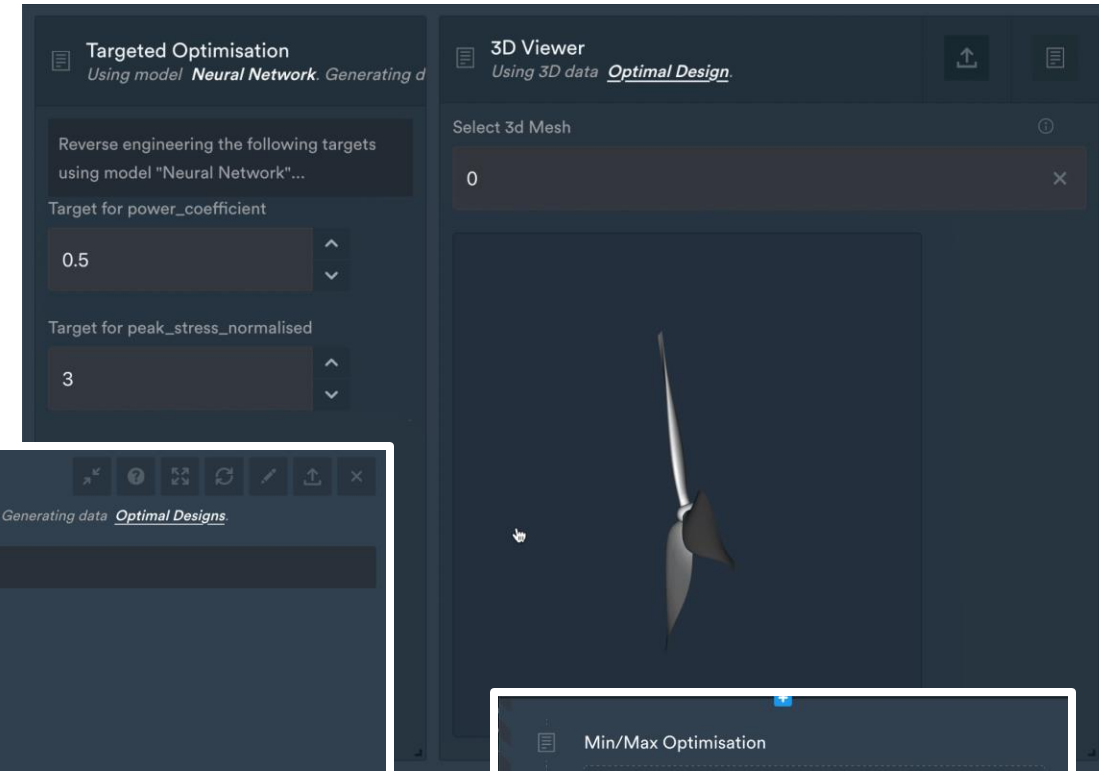# AI Optimisation

Min/Max Optimisation and Targeted Optimisation

Our AI Optimisation algorithms enable you to find the best design variables (inputs) which satisfy target performance metrics (outputs). Simply specify your goals (either defining specific parameter values, or aiming to minimise or maximise parameters). The AI Optimisation algorithms will then use your trained AI model to search for your target and return the optimal inputs. You can also restrict inputs, which means imposing constraints on the design space in which optimal designs can be found.

Recommendation systems

With AI Optimisation, you can choose to get recommendations for several different sets of optimum design variables for your problem. This is will enable you to make a choice according to factors which may not have been accounted for previously (aesthetics, cost, personal preference, etc.)

3D shape optimisation

If opted with the 3D Deep Learning module, AI Optimisation will enable you to generate performance-optimised 3D designs. Generated CAD files are directly exportable.
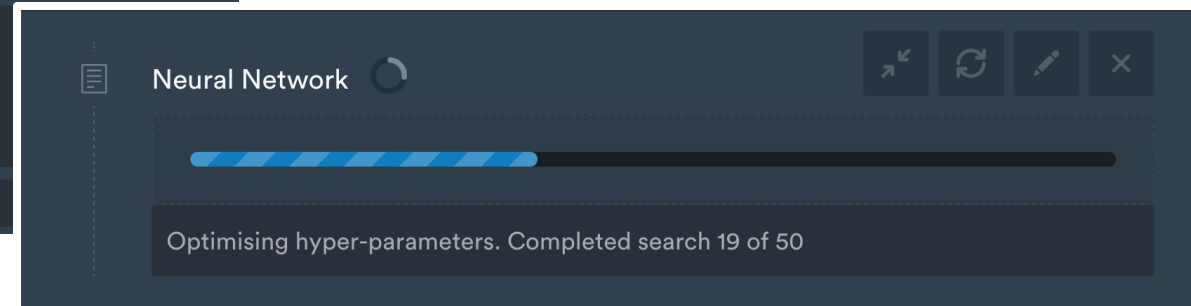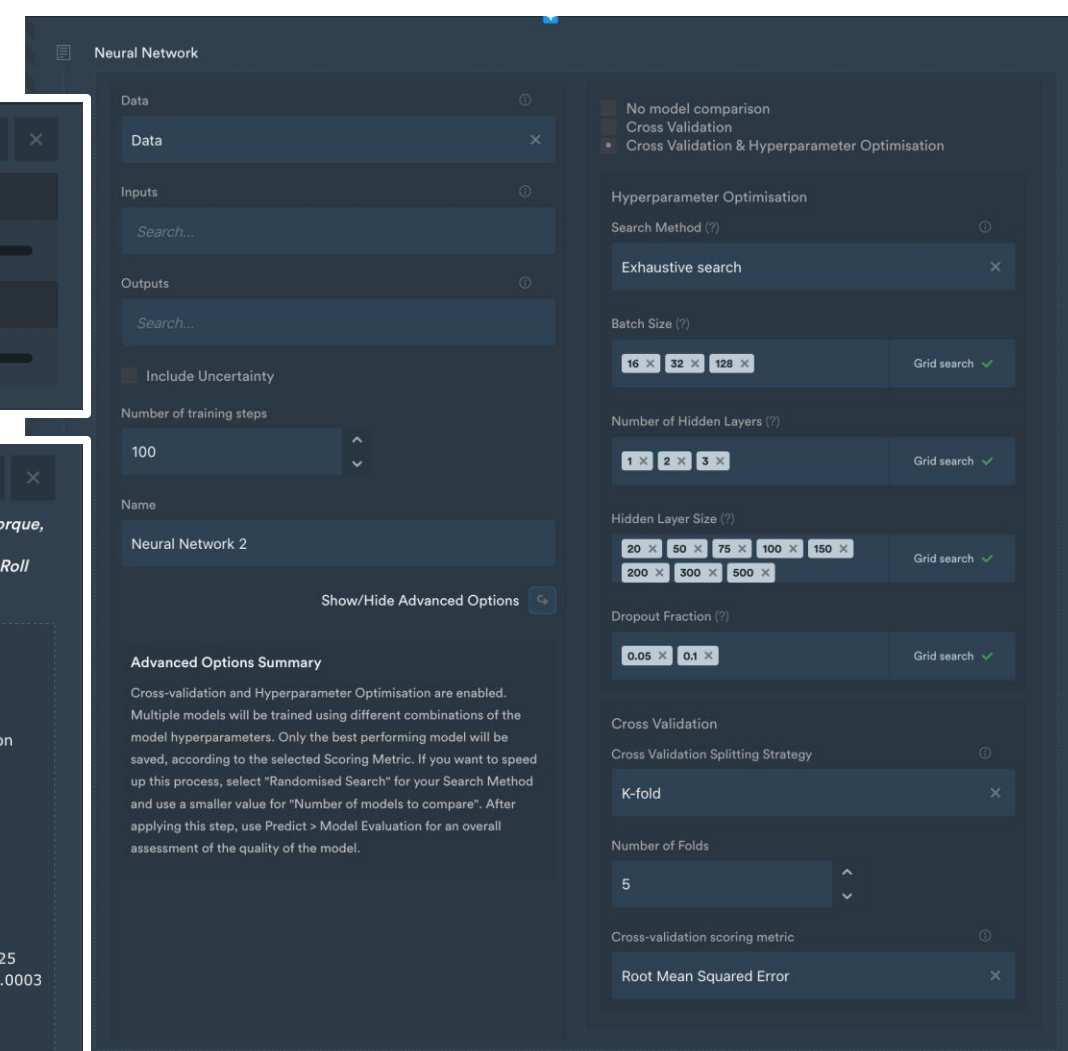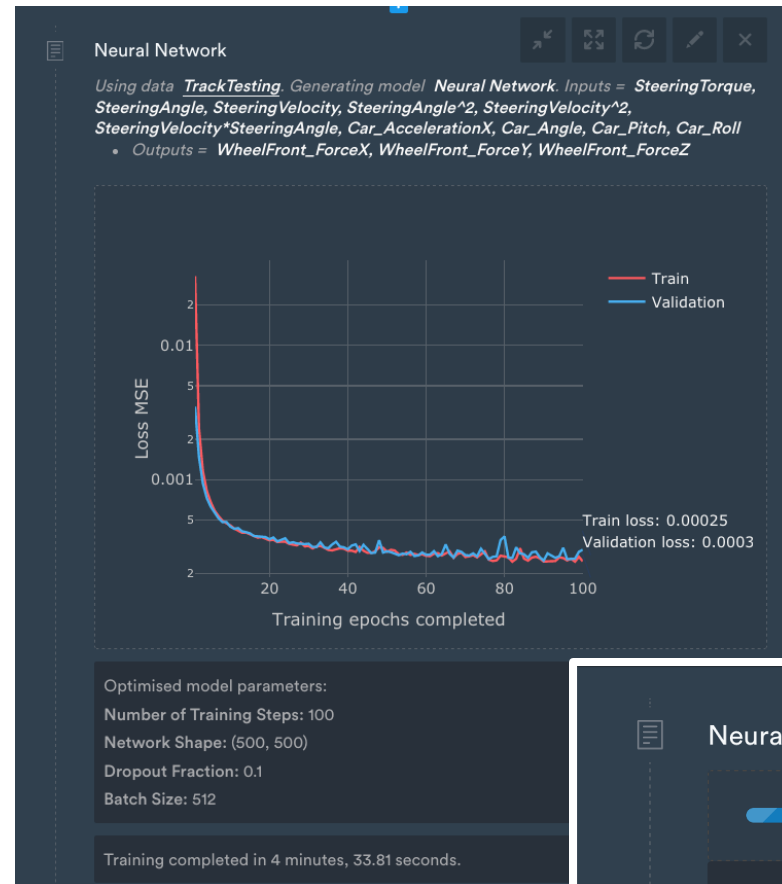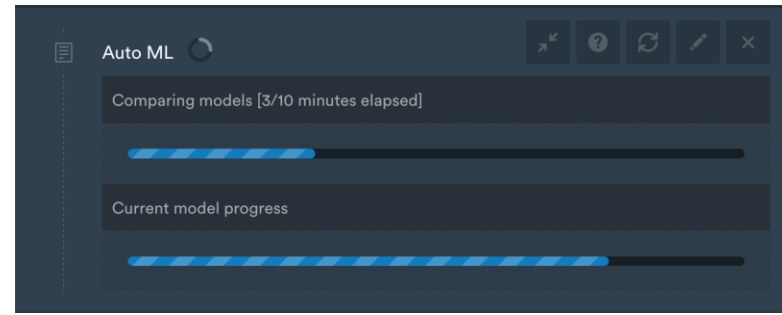

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Guided and Automated Machine Learning

Hyperparameter Optimisation

AI models all have different 'settings' called hyperparameters which have a large impact on prediction accuracy. For example, two different neural network structures trained on the same dataset will produce predictions of varying reliability. With Hyperparameter Optimisation (also called Grid Search), you can automate this process for all our Regression models. Monolith will train multiple models with different hyperparameters in parallel, and only retain the one which performs the best. This enable you to easily find the best AI model for your use case.

AutoML

Our AutoML model optimises machine learning pipelines using genetic programming. Note this model is separate from our conventional Regression models.


Auto ML

Comparing models [3/10 minutes elapsed]

Current model progress

Neural Network

*Using data **TrackTesting**. Generating model **Neural Network**. Inputs = SteeringTorque, SteeringAngle, SteeringVelocity, SteeringAngle^2, SteeringVelocity^2, SteeringVelocity*SteeringAngle, Car_AccelerationX, Car_Angle, Car_Pitch, Car_Roll*
- *Outputs = WheelFront_ForceX, WheelFront_ForceY, WheelFront_ForceZ*

— Train
— Validation

Loss MSE vs Training epochs completed

Train loss: 0.00025
Validation loss: 0.0003

Optimised model parameters:
Number of Training Steps: 100
Network Shape: (500, 500)
Dropout Fraction: 0.1
Batch Size: 512

Training completed in 4 minutes, 33.81 seconds.

Neural Network

Data
Data

Inputs
Search...

Outputs
Search...

☐ Include Uncertainty

Number of training steps
100

Name
Neural Network 2

Show/Hide Advanced Options

Advanced Options Summary

Cross-validation and Hyperparameter Optimisation are enabled. Multiple models will be trained using different combinations of the model hyperparameters. Only the best performing model will be saved, according to the selected Scoring Metric. If you want to speed up this process, select "Randomised Search" for your Search Method and use a smaller value for "Number of models to compare". After applying this step, use Predict > Model Evaluation for an overall assessment of the quality of the model.

☐ No model comparison
☐ Cross Validation
◉ Cross Validation & Hyperparameter Optimisation

Hyperparameter Optimisation

Search Method (?)
Exhaustive search

Batch Size (?)
16 ✕ 32 ✕ 128 ✕   Grid search ✓

Number of Hidden Layers (?)
1 ✕ 2 ✕ 3 ✕   Grid search ✓

Hidden Layer Size (?)
20 ✕ 50 ✕ 75 ✕ 100 ✕ 150 ✕   Grid search ✓
200 ✕ 300 ✕ 500 ✕

Dropout Fraction (?)
0.05 ✕ 0.1 ✕   Grid search ✓

Cross Validation

Cross Validation Splitting Strategy
K-fold

Number of Folds
5

Cross-validation scoring metric
Root Mean Squared Error

Neural Network

Optimising hyper-parameters. Completed search 19 of 50

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Explainable AI and Uncertainty Quantification

Explainable AI

Explain Predictions and Sensitivity Analysis enable you to understand what are the most important input parameters (design variables or test conditions) which affect your outputs (performance or quality metrics). With these tools, you can rank the input parameters which most affect the quality/performance of your product. Having this understanding will enable you to know where to concentrate your design/engineering efforts in order to improve your product. It's a point in the right direction which helps you identify what to double-down on and what doesn't have much influence on the outcome of your tests or simulations.

Uncertainty quantification

The predictions from some of our models, including Neural Networks and Gaussian Process Regressions are accompanied by a measure of prediction uncertainty which is calculated with statistical algorithms coupled to model training. This predicted uncertainty can help you build trust in your model, but also identify the regions of your design space in which data might be sparse or volatile.
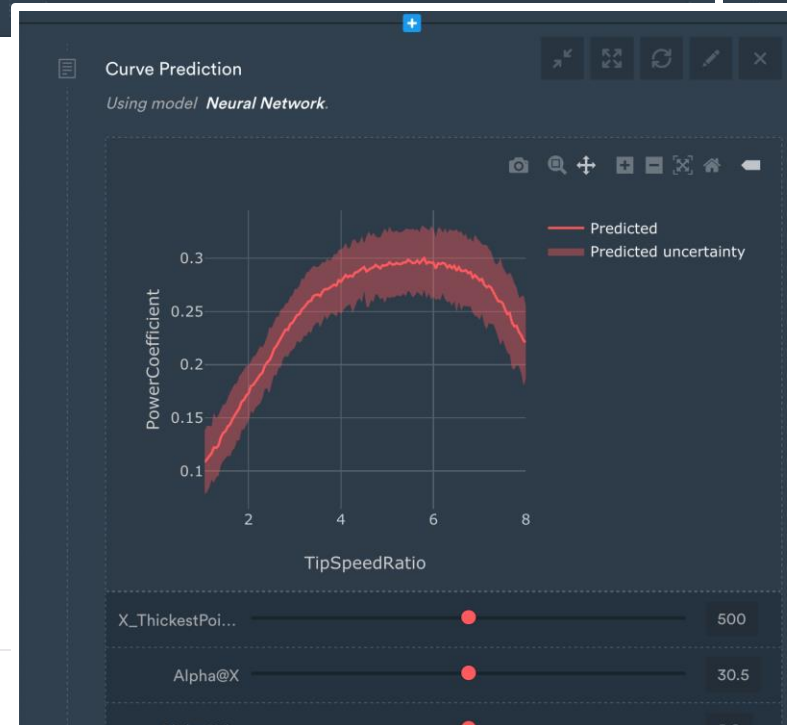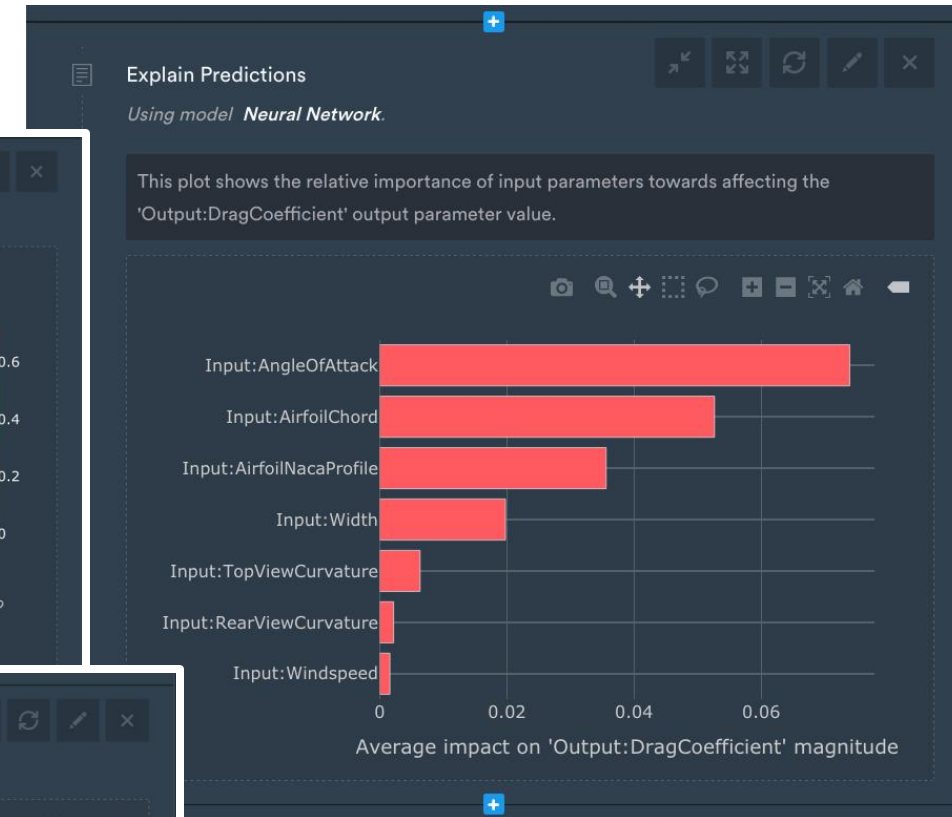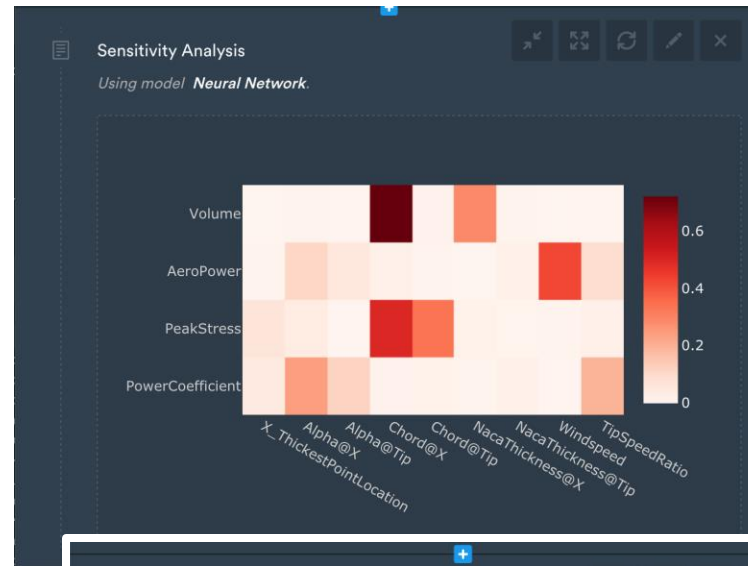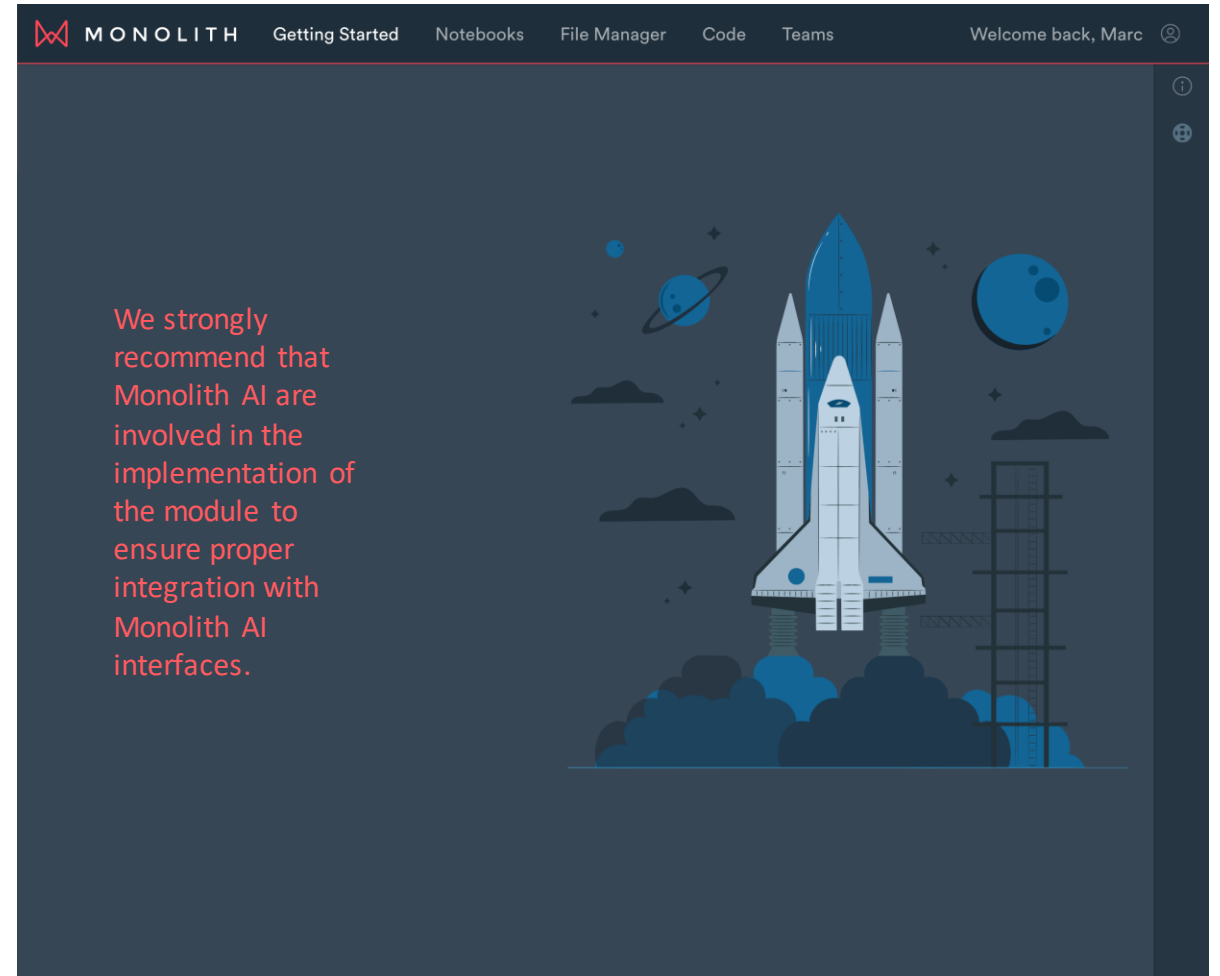
SDK / API Integration

Embedded dashboards

Our interactive dashboards enable you to share your results in a way which makes them interpretable and reusable by your colleagues or clients. By embedding dashboards into your own secure portals or websites, you'll make them even more accessible. For example, this could enable you to let your suppliers make predictions themselves about the technical compatibility of a product to a new set of operating conditions.

Using your API libraries

We can embed your API code into Monolith notebooks in order to stream data in to and out of a notebook pipeline. This means you can send data from your environment to Monolith, and receive machine learning predictions back in near-real-time.

Parsing raw data

We understand the data structure of your raw can be difficult to manage, and data files themselves can be difficult to read. We've built a number of custom data parsing algorithms which help automatically extract the information needed from raw data files.

We strongly recommend that Monolith AI are involved in the implementation of the module to ensure proper integration with Monolith AI interfaces.

Let's talk more.

You can either book a demo or ask any questions by reaching out.

www.monolithai.com