

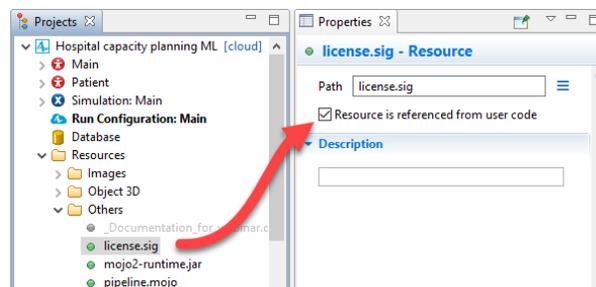
Capabilities

Q1. Can we deploy the simulation and AI components on a website?

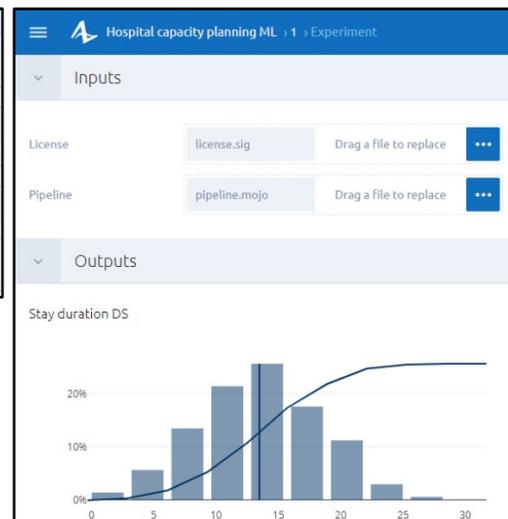
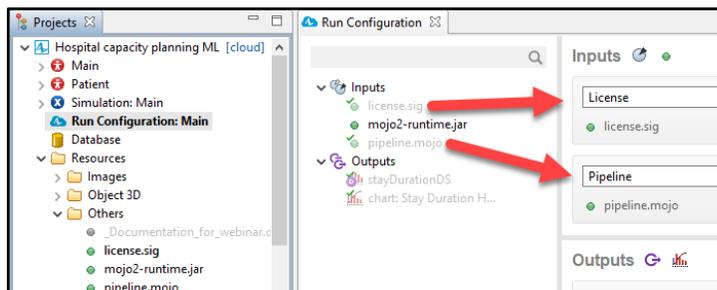
- Yes! AnyLogic simulation models can be exported to a standalone Java application or to the AnyLogic Cloud (either the public one – at cloud.anylogic.com – or a private one if your company/organization has purchased it).
When you export the model, it includes all the necessary dependencies – from the webinar, this would include the H2O runtime jar, license, and pipeline MOJO.
- The best way to incorporate an AnyLogic model into a website would be to upload it to the Cloud and use the AnyLogic Cloud API to interface with it. Documentation can be found here: <https://cloud.anylogic.com/files/api-8.5.0/docs/index.html>
With the API, you can embed the animation (shown in [Section 1.1](#) of the Cloud docs) or simply use JavaScript and interactive components to provide input/output to the model (for some examples, see [Section 3](#) of the Cloud docs).

Q2. Can a model using MOJO pipelines from H2O.ai be exported to AnyLogic Cloud?

- Yes! Before exporting, you should ensure that any necessary files are included as being referenced (see image below). Only files that have the resource box checked or have a green dot next to the file name will be included. For more information, see this AnyLogic help article: <https://help.anylogic.com/topic/com.anylogic.help/html/connectivity/resources.html>



- Additionally, if you include the license file and pipeline MOJO file as inputs in the Run Configuration, these files will be replaceable from the Cloud environment (see images below). This can be used to update either file without reuploading the simulation model.



Q3. Can Driverless AI be used to predict multiple columns of the dataset?

- A single Driverless AI experiment will optimize a metric on a single target column at a time. It will not optimize on more than one column at a time.

Q4. Do solutions utilizing simulation and machine learning require a person to understand and work with both AnyLogic and H2O? Is deep expertise required in both tools to make them blend?

- A person does *not* need to have deep expertise in both simulation and machine learning to benefit from the convergence of them! With proper communication of project goals and progress, tasks could be separated between professionals in each domain. Having said that, it would benefit all involved to have some theoretical background and a basic understanding of the underlying concepts of both domains.

- Fortunately, both tools provide user friendly experiences. AnyLogic provides a graphical interface that simplifies the modeling process and minimizes the need for coding in most practical cases. Similarly, H2O.ai's Driverless AI simplifies the training of ML models by automating tedious tasks.

Both provide a wide range of educational resources for people who are interested in learning more about any of these platforms. Those interested in AnyLogic can find the training schedule here: <https://www.anylogic.com/resources/training-events/> and help documentation here: <https://help.anylogic.com/index.jsp>; those interested in H2O can find a wide array of learning material here: <https://training.h2o.ai/>

Theory

Q5. How can an ML model be more accurate than the data it is given?

- It cannot! The goal of using machine learning is (essentially) to formulate a function which can provide an output which is accurate relative to the trends in the historical data. Part of what makes it so useful is that, unlike fitting a straight line in a linear regression analysis, the algorithms used in machine learning can identify patterns and trends that comparatively impossible for humans to identify and describe formulaically.

Q6. Why try to predict what the simulation would output when you could simply just simulate it?

- For reference to readers: This is referring to Case 6 that Arash mentioned, where the outputs of a simulation model are used as training data for a machine learning model. Allowing you to pass the simulation's inputs to a machine learning model, which would produce outputs similar to the simulation model.
- The purpose of this is primarily for efficiency purposes. It would be used in cases where computational resources are limited (e.g., edge devices) or when it's important to get results back quickly (as some more complicated simulation models can take many minutes to run). The

caveat to this is that the machine learning model would be an approximation of the simulation, thus requiring the desired accuracy to have a relatively larger margin (note: this isn't applicable in all cases, but is more true when the simulation has more stochastic or non-linear components to it).

Q7. When you implement more complex models with higher requirements to computation power (e.g., lots of features, deep learning), how can you keep the simulation run time low?

- Most of the computational power needed to train machine learning models happen separate from the simulation (in the training phase). Once training is complete, the power needed to query the machine learning model is relatively minimal compared to the requirements of processing a simulation model.

Use cases

Q8. Can you provide some information on integrating a manufacturing process simulation model and reinforcement learning, where we use the simulation output as training for RL for automating decision making to improve process efficiency?

- Since you're wanting to use the outputs of the simulation model to train an AI, reinforcement learning wouldn't be as applicable. This is because reinforcement learning works based on a loop of interacting with the environment and getting feedback from it. The description of the problem would be more applicable to one of the other methods of machine learning (supervised, semi-supervised, or unsupervised learning) – fortunately, you can train a machine learning model using any of the three with H2O.ai!

Q9. How can we leverage simulation and machine learning together to create a manufacturing process digital twin?

- This falls under cases 1, 2, & 3 of in the “simulation vs machine learning section” shown in the webinar. If incorporation of an ML model into the simulation increases its predictive power, doing so will result in a more representative digital twin.

Q10. Can machine learning be used for price optimization in the finance industry?

- Price optimization is possible with machine learning, provided (like always) that the right data is available. In an AB testing scenario for example, having detailed information on both the consumers and the product variations is essential for capturing the underlying patterns. Achieving good model accuracy and generalizability is of course also very important; a testimonial from an H2O.ai customer in the financial services sector can be read here: https://www.h2o.ai/wp-content/uploads/2020/02/Market-Axess-Customer-Case-Study_rnd3.pdf

Implementation

Q11. Does H2O.ai Driverless AI come embedded into AnyLogic? Do the open source H2O packages also operate in the AnyLogic environment?

- Driverless AI is a standalone application and is what Hemen was demonstrating towards the end of the webinar. From this application, you can visualize your data and create experiments to train/test ML models. Once a desired ML model is developed, you can export a model pipeline which functions independently of Driverless AI. If you take a look at the Driverless AI workflow (seen here: <http://docs.h2o.ai/driverless-ai/latest-stable/docs/userguide/workflow.html>), AnyLogic is not incorporated until step 5, “Deploy the scoring pipeline”. The model pipeline is what you use embed inside of AnyLogic to get predictions from your trained ML model.
- In the demo, we embedded an H2O Driverless AI MOJO model pipeline in AnyLogic. It is also possible to integrate an H2O open source MOJO, but it would require more coding effort than with the Driverless AI MOJO.

Prices and licensing

Q12. What is the price of H2O Driverless AI?

- H2O Driverless AI is an enterprise software and the price is dependent on the engagement. Connect with H2O.ai sales team at <https://www.h2o.ai/company/contact/> to discuss details and get a quote.

Q13. Is that training from H2O.ai free?

- Most training for H2O products is available for free at H2O.ai Learning Center (<https://training.h2o.ai/>). There are also self-paced tutorials available at <https://h2oai.github.io/tutorials/>
- You can also get a free 21 day trial license for H2O Driverless AI by registering at: <https://www.h2o.ai/try-driverless-ai/>
- H2O.ai also has other open source products that you can read about here: <https://www.h2o.ai/products/>

Q14. Does the training model have limitation from the licensing perspective?

- No, as long as your license is active, it will work.

More information

Q15. Where can I find the demo of the hospital simulation shown in the webinar to try it and reproduce it?

- To download the demo model shown in the webinar, head on over to the H2O page on AnyLogic's website: <https://www.anylogic.com/features/artificial-intelligence/h2o-ai/>
From there you can download the hospital demo, in addition to a supply chain demo.

Q16. Where can I find more about H2O.ai?

- The website for H2O.ai can be found here: <https://www.h2o.ai/>
There you can find information about H2O.ai's product line, resources, and documentation.

Q17. Have you published any papers about the combination of machine learning and simulation modeling?

- AnyLogic has published a white paper on the use of simulation and artificial intelligence in businesses, which you can access from here: <https://www.anylogic.com/resources/white-papers/artificial-intelligence-and-simulation-in-business/>