

From Computer to Clinic

APOLLO



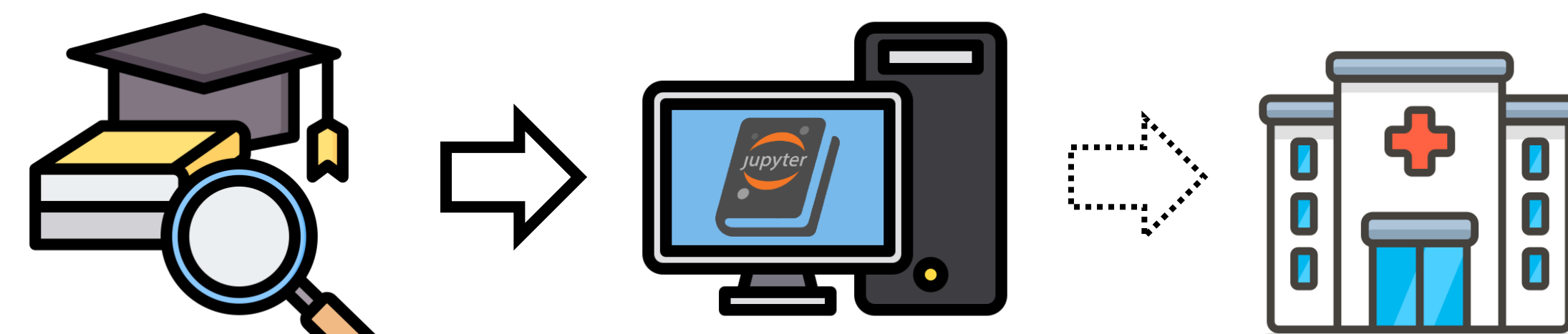
A Platform for Deploying and Validating Image-Based Machine Learning Models

Challenge

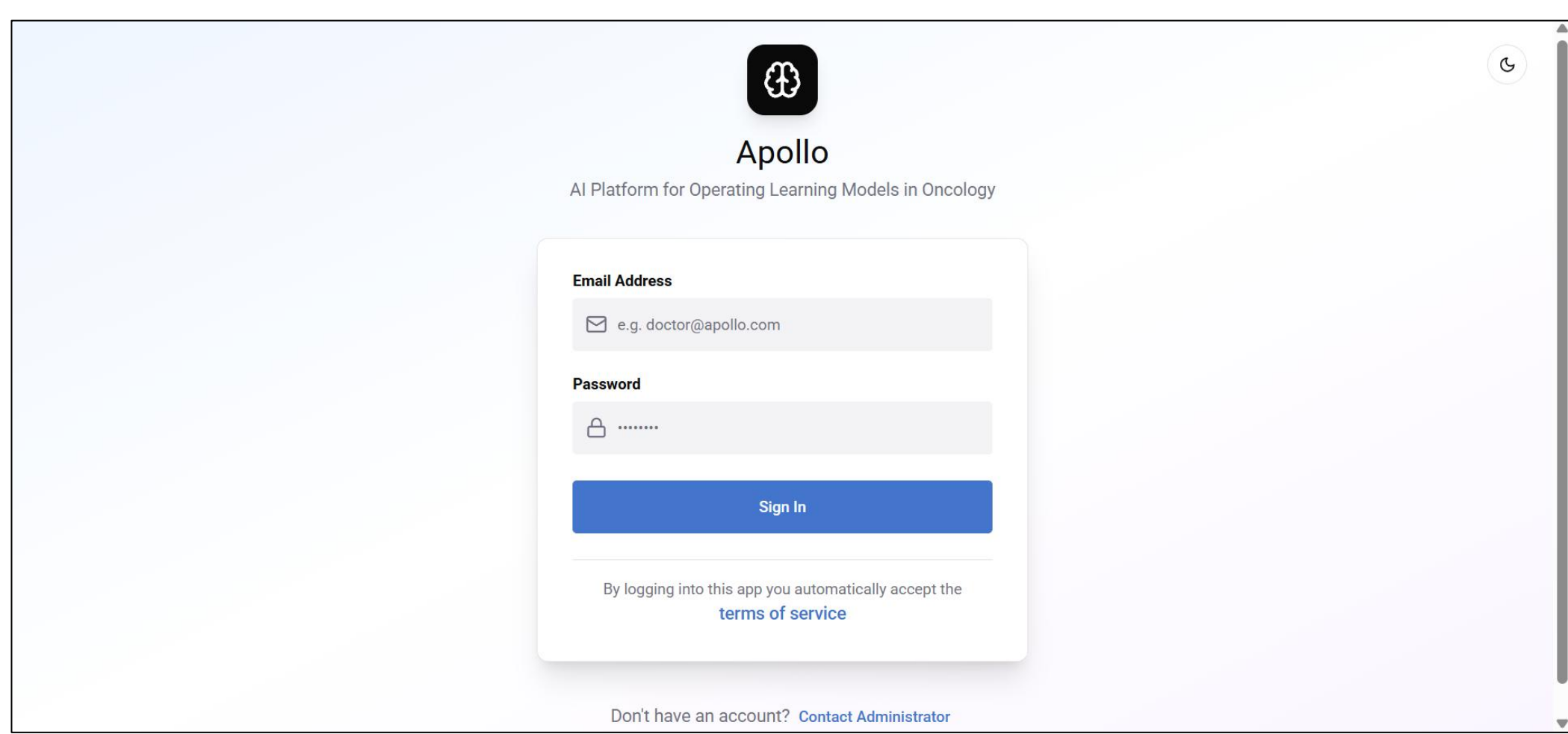
- Medical imaging is used in many stages of a cancer patient's journey, from diagnostic radiology to radiotherapy
- Image-based AI applications have been developing rapidly, from cancer detection on mammograms to auto-segmentation on CT scans
- However, many AI innovations are stuck in notebooks, and clinical validation & translation is slow, fragmented, and risky

Solution

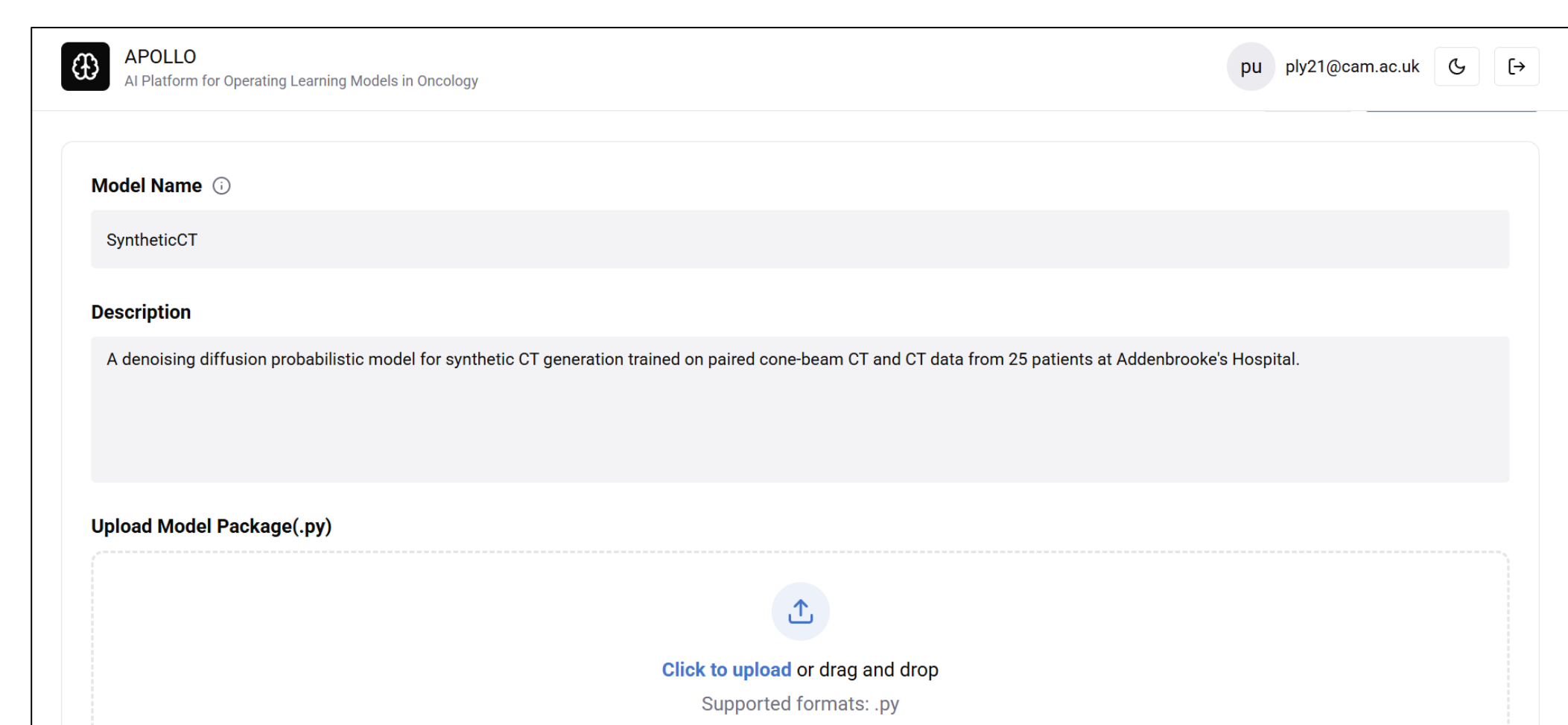
- APOLLO: AI Platform for Operating Learning modeLs in Oncology
- A rapid prototyping and deployment browser-based platform that:
 - Allows researchers to deploy trained image-based AI models for real-world validation and usage
 - Allows clinicians to evaluate model outputs on real cancer imaging data in clinical workflows



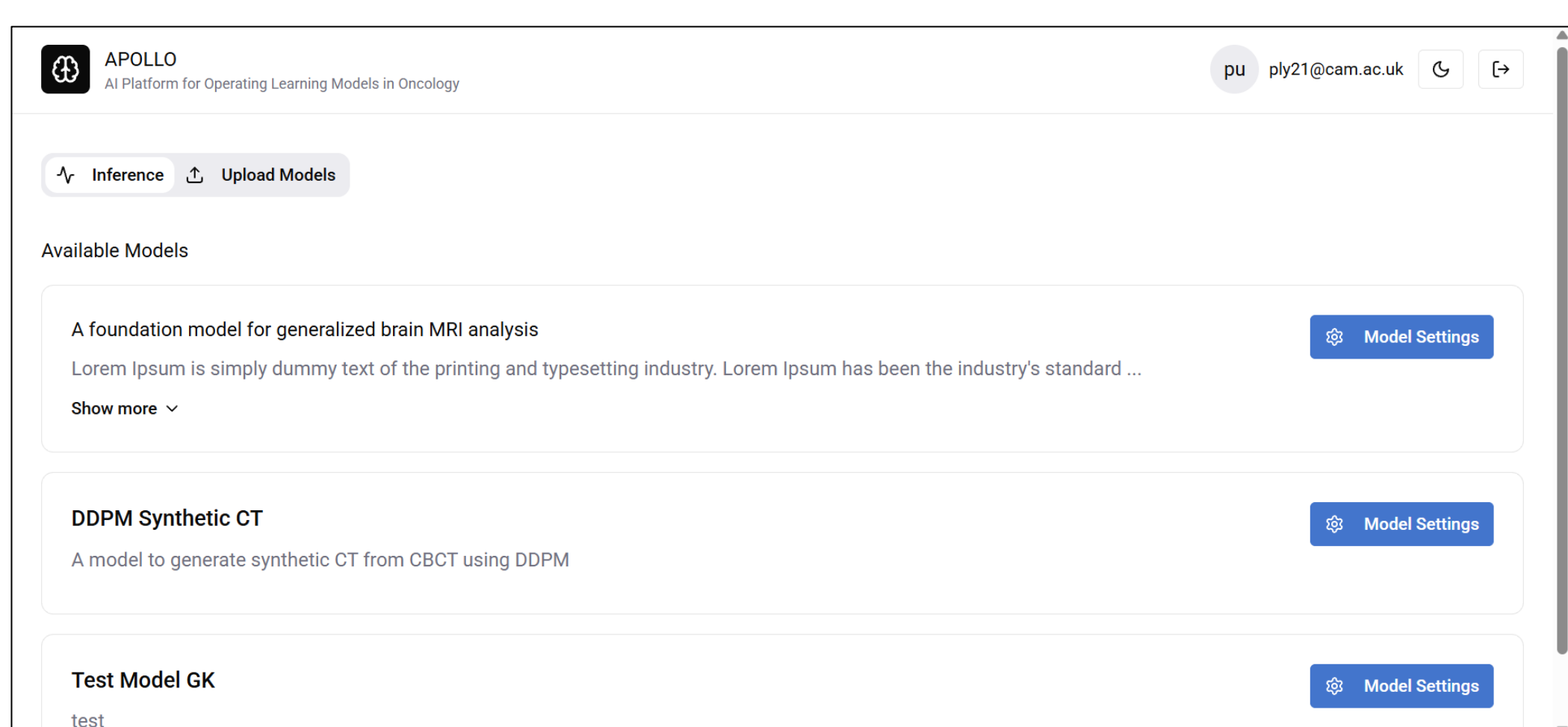
Use Case



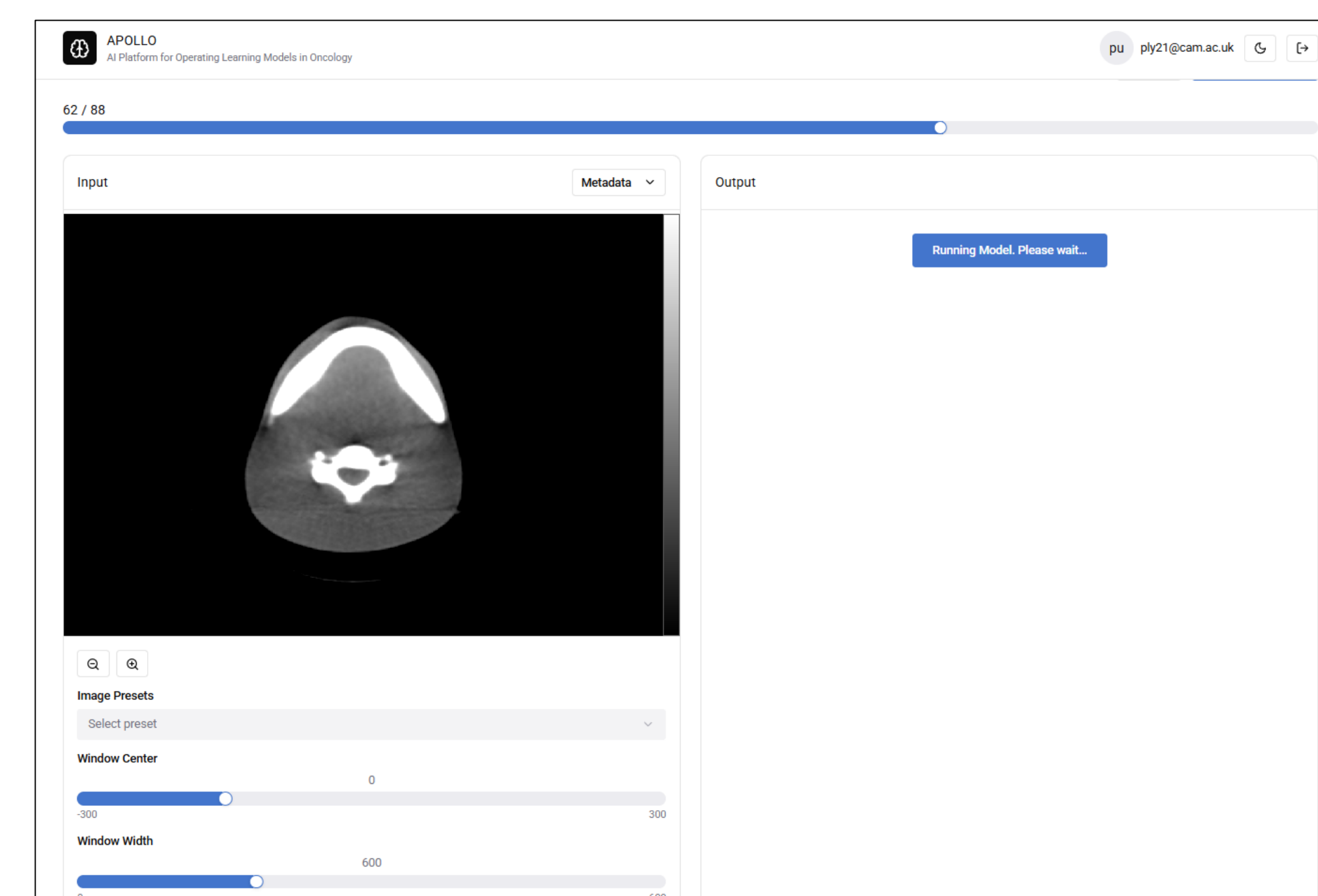
- A PhD student at a university has developed a denoising diffusion probabilistic model (DDPM) that improves the quality of a cone-beam CT (CBCT) into a synthetic CT of diagnostic quality.
- They want to validate this model on real patient data across different populations and eventually deploy it for clinical use.



- After training the model on institution data, the student uploads the model and trained weights on APOLLO, with the associated model card and documentations.



- A clinician in a different hospital can get on APOLLO to browse and select the uploaded models, weights, and hyperparameters.



- The clinician is then able to upload a local CBCT DICOM image stack, perform inference using the model, view the synthetic CT output, and download the output DICOM with the log files.
- After the model is cleared for clinical use, this synthetic CT can be used for dose recalculation in an online adaptive radiotherapy workflow.

Summary

- APOLLO is currently a research-grade prototype platform with early clinical engagement, allowing rapid testing of new AI ideas, reproducible evaluation across datasets, and reduced time from development to validation and deployment.
- With further funding, we aim to pilot APOLLO as a regulatory-compliant SaMD at the Cambridge University Hospitals.

Get in touch for a demo: Ping Lin Yeap <ply21@cam.ac.uk> & Prof Rajesh Jena <rjena@nhs.net>

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