## Project Title

Transforming Assignments of Porter Services with Artificial Intelligence (AI)

## Project Lead and Members

Project lead: Sally Oh

Project members: Tey Yew Wei, Dennis Chua

## Organisation(s) Involved

KK Women's and Children's Hospital

## Healthcare Family Group(s) Involved in this Project

Medical, Allied Health

## Applicable Specialty or Discipline

Patient Service Associate

## Project Period

Start date: not indicated

Completed date: not indicated

## Aims

Use Artificial Intelligence (AI) to drive accuracy on matching of tasks to porters and auto-assignment of tasks to drive productivity and enhance patient experience in terms of shorter wait time for porters.

## Background

Porters are key backbone of support operations in the Hospital. Their duties include patient-centric tasks such as transporting and transferring patients on trolley or in wheelchairs between wards and ancillary departments, and non patient-centric tasks

for example, sending and collecting lab specimens, clinical records and medical equipment across hospital.

Controllers at Patient Transport Services Department (PTS) process the requests and match them to porters according to task attributes such as type and time-sensitivity, and porter attributes for example number of pending tasks, upcoming break time etc.

They make decisions using general guidelines and job experience which often result in inconsistency due to subjectivity and personal biases. Coupled with about 10% annual turnover of controllers and porters, a viable solution is needed for a smooth porter service operations in the hospital.

## Methods

AI-enabled e-portering system using machine learning random forest classification model to perform porters' task assignments was decided after evaluating other types of AI.

Random Forest uses labelled training data to help system recognise patterns and predict accurate outcomes. It is a widely common supervised machine learning algorithm that combines the output of multiple decision trees to give a result based on average few. The team chose the model for its robustness and ability to handle highly dimensional and sparse datasets, and its strength in automating routine and time-consuming work like task assignments.

To be more accurate, large number of decision trees is necessary. First, we set criteria to extract, scrub and analyse historical raw data in both the database and hardcopy manpower rosters, before organising it into a format that is useable by AI algorithm.

A probability score for each feature such as Task Count, Drop- off Destination Floor Level and Next Pick-Up Floor Level was computed from the training which was used to recommend the most suited porter for a new task request. Please see illustration below.

## Results

See poster appended/below

## Conclusion

Leveraging AI model brings portering task assignments to a whole new level. Categorisation and prioritization of tasks optimize porter resources and improve efficiency and patient service delivery. Controllers are reskilled and moved into new roles taking on higher order work such as assisting Supervisors in generating utilization reports.

## Project Category

Technology

Digitalisation, Automation, Artificial Intelligence, Machine Learning, Digital Platform

## Keywords

Porters, Transporting, Transferring, Patient Transport Services Department, Accuracy, Auto-Assignment Task, Sparse Datasets, Task count, Controllers

## Name and Email of Project Contact Person(s)

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SingHealth

# Transforming Assignments of Porter Services with Artificial Intelligence (AI)

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Tey Yew Wei, Assistant Director, Patient Transport Services
Dennis Chua, Assistant Manager, Patient Transport Services

## *Introduction*

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## *Aim*

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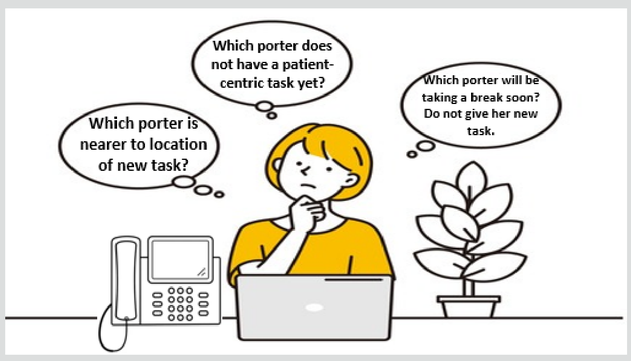


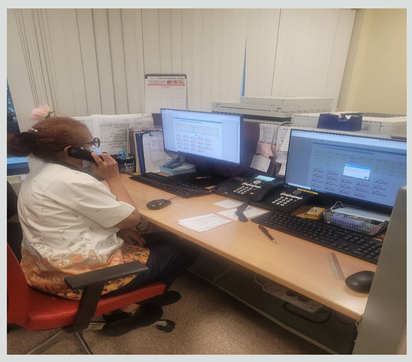

## *Method*

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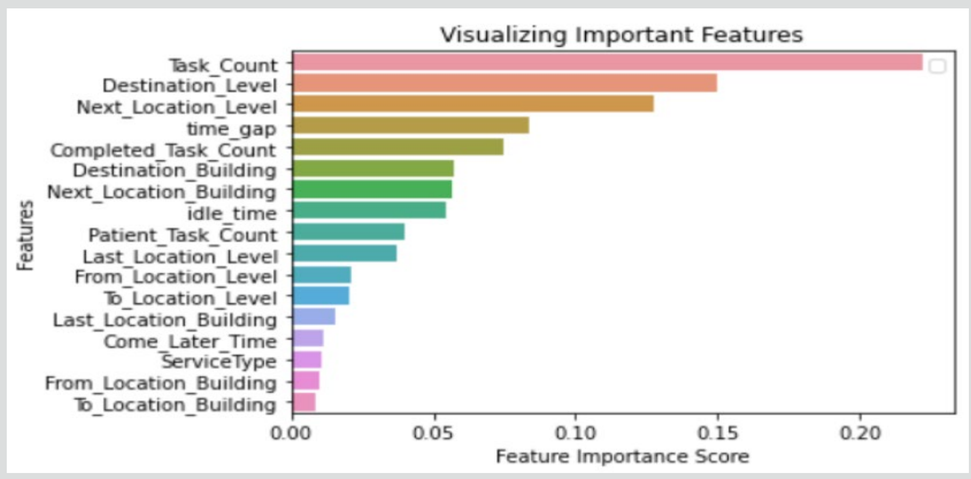
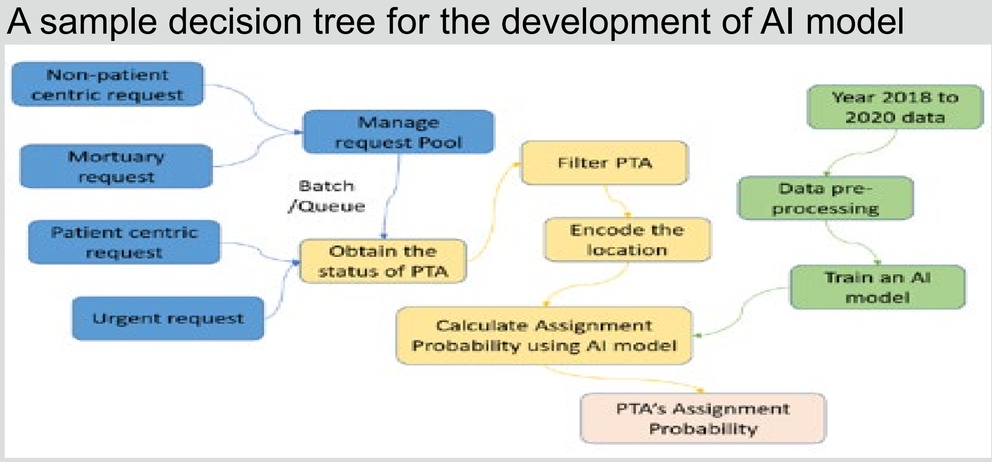
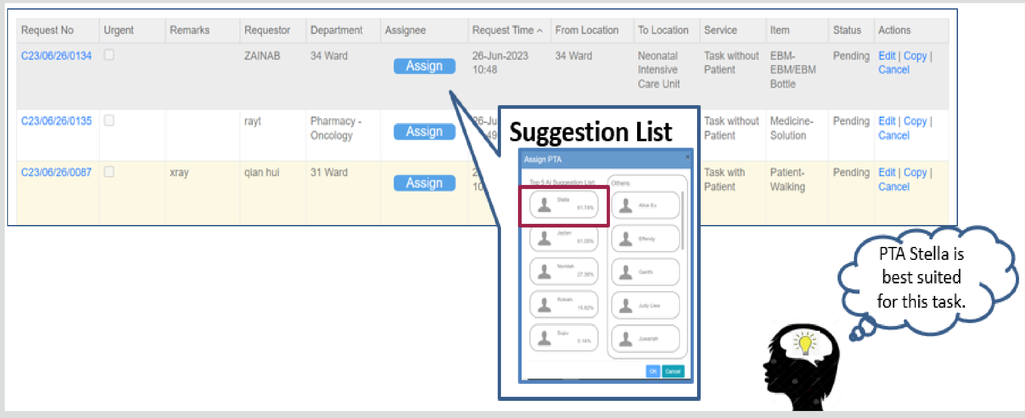



A sample decision tree for the development of AI model




AI model's suggestion list of porters for Controller's assignment




## *Conclusion*

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