

# Dashicurt: A Real-time ICU Dashboard Monitoring System using Artificial Intelligence

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# Presentation flow

- Introduction
- Related Works
- Propose Method
- Result and Evaluation
- Conclusion
- Future Work



Source: <https://adigaskell.org>

# INTRODUCTION

## ICU

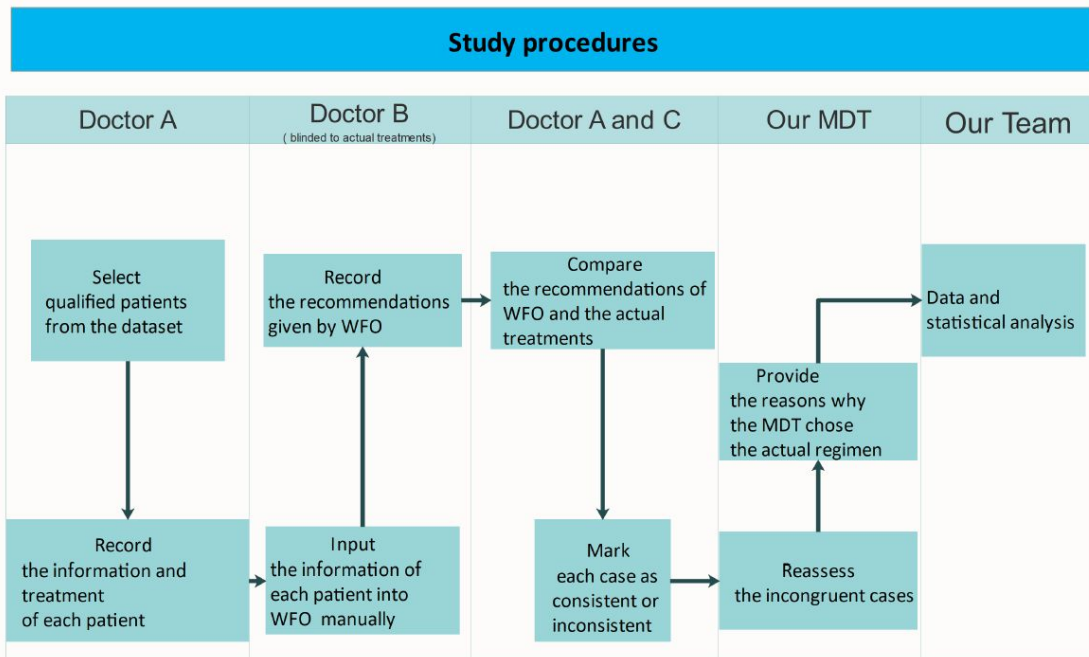
The Intensive Care Unit is a specialized and complex part of a hospital management system.



# Related Work

## Related Work 1

The previous research has been developed an Using AI for Treatment Recommendations Patients with Lung Cancer

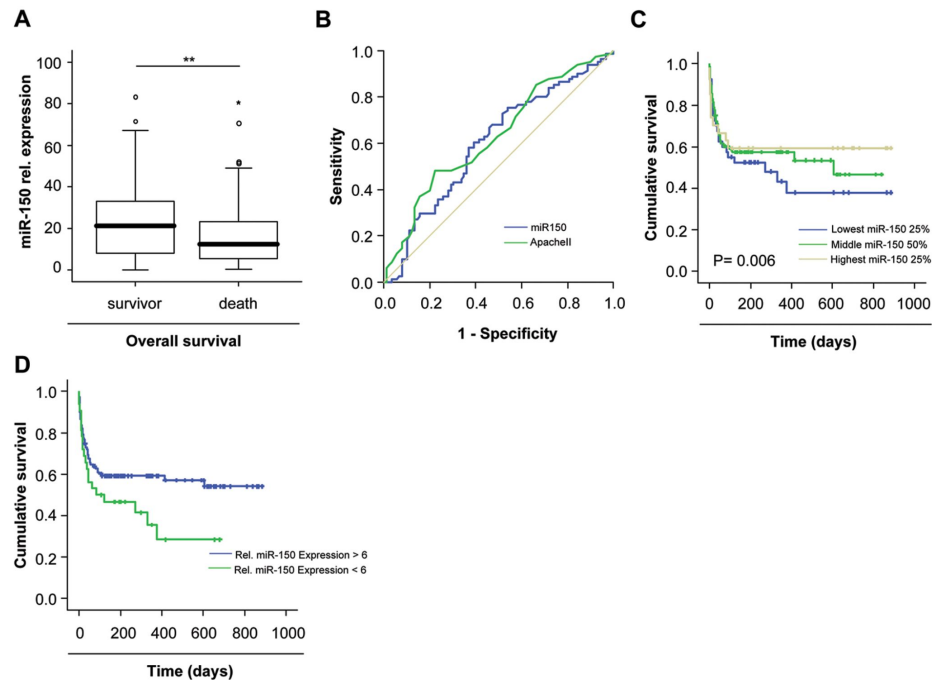


Reference: Liu, Chaoyuan, et al. "Using artificial intelligence (Watson for Oncology) for treatment recommendations amongst Chinese patients with lung cancer: feasibility study." *Journal of medical Internet research* 20.9 (2018): e11087.

## Related Work 2

The research Circulating  
MicroRNA-150 Serum Levels  
Predict Survival in Patients with  
Critical Illness and Sepsis

## Related Work



Reference: Földi, Mária, et al. "Obesity is a risk factor for developing critical condition in COVID-19 patients: a systematic review and meta-analysis." *Obesity Reviews* 21.10 (2020): e13095.

# PROPOSED METHOD



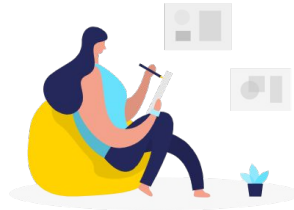
## Software Development Life Cycle

### Requirement Analysis



Gathering system requirement

### Design



Designing system architecture

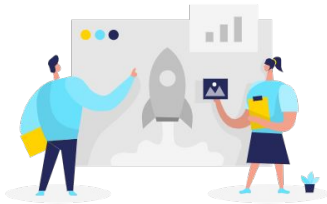
### Development



Implement system design

# Proposed Method

## Testing



Check the web according to function

## Deployment



Prepare the production environment is ready

## Maintenance



Monitor website performance, security, update and other

# Result and Evaluation

 32697087

ICU



Dashboard

 Highlight Bed Selection

Monitoring

 Vital Patient SOFA Score Treatment

Analytics

 Summary Forecasting Recommend Similarity

## Highlight

### Sofa Score

**Overall Score : 6**

From :Respiratory Coagulation,Liver,  
Cardiovascular, Nervous System, Renal

### Treatment

**Vasopresor**

doses : 5mg, Strength:Check with Doctor,  
Vasopressors are given through intravenous (IV)  
infusion and the dose is adjusted to the patient's  
needs.

### Summary

**32697087**

Condition Progression: Congestive Heart Failure  
(CHF): Patients with CHF who have severe and life-  
threatening heart failure may require intensive  
care in the ICU.

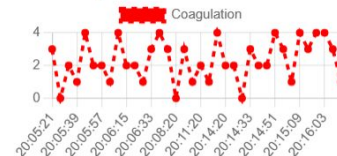
### Sofa Score




### Vital Sign







### Forecasting





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 Similarity


**Bed Selection**


  
Bed 1  
SELECT


  
Bed 2  
SELECT


  
Bed 3  
SELECT

  
Bed 4  
SELECT

  
Bed 5  
SELECT

  
Bed 6  
SELECT

  
Bed 7  
SELECT

  
Bed 8  
SELECT



# Result and Evaluation

## Dashboard

- Highlight
- Bed Selection

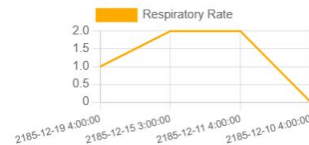
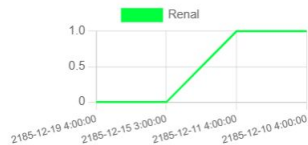
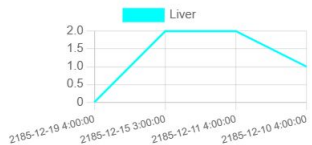
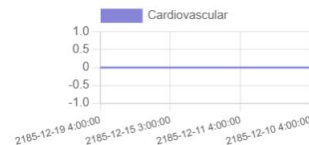
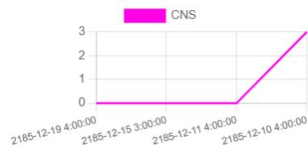
## Monitoring

- Vital Patient
- SOFA Score
- Treatment

## Analytics

- Summary
- Forecasting
- Recommend
- Similarity



## Sofa Score



Stay Id	Start Time	End Time	Respiratory	Coagulation	Liver	Cardiovascular	Nervous System	Renal
32697087	2186-01-06 3:00:00	2186-01-06 4:00:00	1	0	0	0	0	1
32697087	2185-12-19 3:00:00	2185-12-19 4:00:00	1	0	0	0	0	0

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## Dashboard

-  Highlight
-  Bed Selection

## Monitoring

-  Vital Patient
-  SOFA Score
-  Treatment

## Analytics

-  Summary
-  Forecasting
-  Recommend
-  Similarity


## ICU



## Treatment History

StartTime	EndTime	Vaso Rate	Vaso Amount	Label
2185-11-16 14:54:00	2185-11-16 15:08:00	5.011.470.057.070.250	4.967.369.022.779.160	norepinephrine
2185-11-17 13:56:00	2185-11-17 15:59:00	1.000.179.418.042.530	8.709.962.150.987.840	norepinephrine
2185-11-18 21:14:00	2185-11-18 23:02:00	40.002.752.939.471.900	3.058.770.271.309.180	norepinephrine
2185-11-19 2:21:00	2185-11-19 4:35:00	20.003.853.933.303.600	18.978.056.596.097.300	norepinephrine
2185-11-19 20:19:00	2185-11-20 0:07:00	20.002.540.622.954.200	3.228.890.136.597.320	norepinephrine
2185-11-26 16:16:00	2185-11-27 1:59:00	500.270.165.503.025	20.649.352.110.922.300	phenylephrine
2185-11-17 1:16:00	2185-11-17 1:30:00	1.000.245.101.749.890	9.914.429.538.184.770	phenylephrine
2185-11-16 1:06:00	2185-11-16 2:30:00	20.010.806.620.121	11.900.827.288.627.600	phenylephrine
2185-11-15 21:27:00	2185-11-17 15:03:00	2.403.846.263.885.490	10.000.000.333.786.000	vasopressin
2185-11-17 15:03:00	2185-11-18 4:45:00	23.999.998.569.488.500	3.287.999.926.507.470	vasopressin
2185-11-18 6:00:00	2185-11-19 9:02:00	23.999.998.569.488.500	6.487.999.854.981.890	vasopressin
2185-11-19 15:37:00	2185-11-20 5:57:00	23.999.998.569.488.500	3.439.999.923.110.000	vasopressin
2185-11-20 23:20:00	2185-11-21 2:07:00	12.003.828.287.124.600	33.410.656.228.661.500	vasopressin



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Dashboard

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## Summary

### Patient Summary

**Id:** 32697087

**Age:** 25

**Gender:** Male

**Admission Date:** Jan 15, 2022

**Primary Diagnosis:** Condition Progression: Congestive Heart Failure (CHF)

### Medical History:

- Chronic Obstructive Pulmonary Disease (COPD)
- Rheumatoid arthritis
- Type 1 Diabetes Mellitus


### Current Condition:

- Condition Progression: Congestive Heart Failure (CHF): Patients with CHF who have severe and life-threatening heart failure may require intensive care in the ICU.


### Plan:


- Provide supplemental oxygen: Patients with COPD in the acute stage may require additional oxygen to maintain adequate oxygen levels in the blood.
- Administer diuretics: Prescribe diuretic medications to promote diuresis and reduce fluid retention in the body, thereby alleviating symptoms of congestive heart failure.




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## ICU

### Recommendation

ID	Vassopressor Treatment
1143155	Vasopressor

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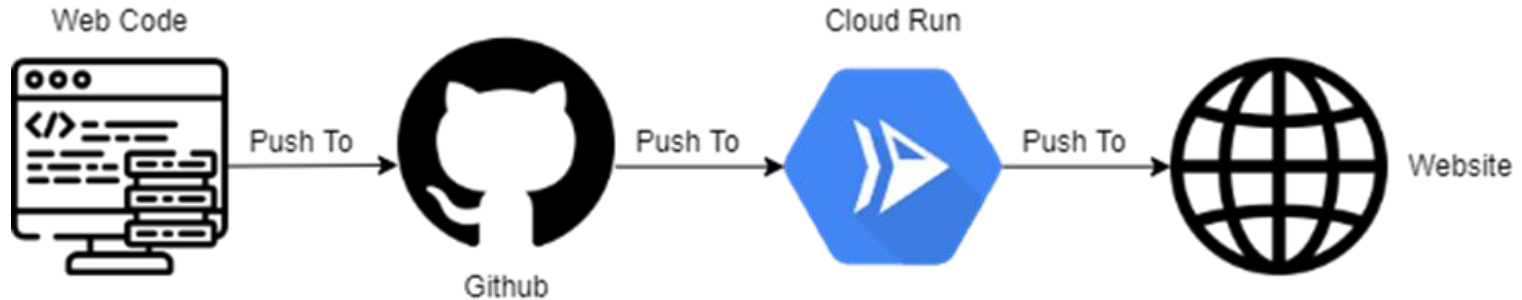
Similarity

Subject ID	HADM ID	Stay ID	ICD Code	Diagnosis	Action
1	123	39762626	A001	Patients undergoing major or invasive surgery	<a href="#">View</a>
2	456	37924137	B002	Acute myocardial infarction heart attack	<a href="#">View</a>
3	789	37270064	C003	Traumatic brain injury	<a href="#">View</a>
3	789	37378964	C003	Severe pneumonia	<a href="#">View</a>
3	789	37289064	C003	Sepsis due to urinary tract infection	<a href="#">View</a>
3	789	30290764	C003	Acute pancreatitis	<a href="#">View</a>
3	789	36270065	C003	Motor vehicle accident with multiple fractures	<a href="#">View</a>
3	789	26150199	C003	Congestive heart failure exacerbation	<a href="#">View</a>

# Conclusion

With the real-time dashboard, nurses and doctor can quickly identify emerging conditions in patients and take immediate action if the patient's condition improves or deteriorates, thus improving efficiency in saving lives in the ICU





In the next stage, the deployed models from previous research will be combined using Docker, stored on GitHub, and then deployed on Cloud Run.

**Thank You**