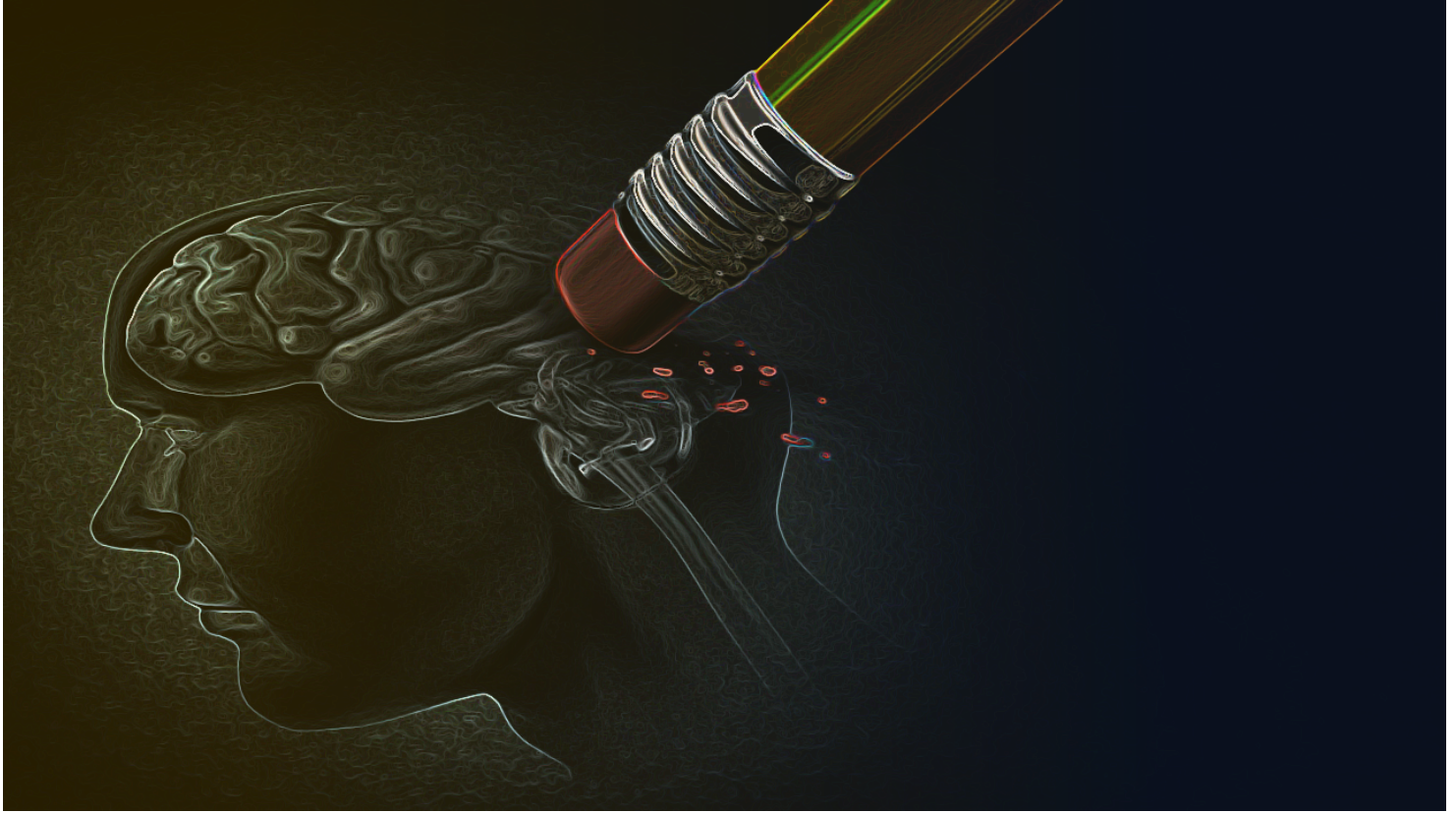




## Case Study: Classification of Alzheimer's Disease Stages

# Classification of Alzheimer's Disease Stages



Alzheimer's disease is a common type of dementia. It is a progressive disease that may last more than a decade. It normally begins with very mild memory loss and develops slowly and progressively and worsens over years. The disease affects most areas of the brain. It can affect the person's overall ability to handle daily activities like thinking, language, problem-solving, judgement, movement and personality. It is estimated that 5.8 million American people are living with this disease and it is one of the top 10 leading causes of death worldwide.

There are different stages of dementia that describe the possible symptoms that may be experienced. The specific treatment of Alzheimer's disease has not been developed yet but the symptoms and the progression can be controlled upon early detection and medication. The approach of using deep learning algorithms have shown outstanding performance in the diagnosis of different medical problems. The progress in neuroimaging techniques (MRI) has made the availability of large-scale neuroimaging data which may be applicable in early diagnosis of Alzheimer's disease. Therefore, most of the researchers are interested in computer-based approaches for the detection of Alzheimer's disease. Proper implementation of such approaches may help the patients and medical practitioners early detecting such disease and start the immediate

## Stages of Alzheimer

### 1. Mild cognitive impairment

Duration: 7 Years

Disease begins in Medical Temporal Lobe



*Symptoms: Short term Memory loss*

### 2. Mild Alzheimer's

Duration: 2 Years

Disease spreads to lateral temporal and parietal lobes



*Symptoms: Reading Problem, Poor object recognition, Poor direct sense*

### 3. Moderate Alzheimer's

Duration: 2 Years

Disease spreads to frontal lobe



*Symptoms: Reading Problem, Poor object recognition, Poor direct sense*

### 4. Severe impairment

Duration: 2 Years

Disease spreads to Occipital Lobe



*Symptoms: Visual problems*



Source: <https://www.mycirclecare.com/4-stages-of-alzheimer-and-their-effects/>

# Model Details

Model developer information and all details needed for governance

eethos ai

Search



Use Cases

Transparency

Trustability

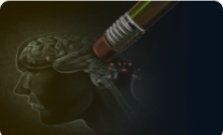
Explainability

Models

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Model Details

Edit Model

No.	Component	Values
1	Current Model Risk Rating	Green
2	Area	
3	Usecase	Classification of Alzheimer's Disease Stages
4	Model Category	Classification
5	Model Dependencies	
6	Model Usage	
7	Model audjustment	
8	Model Owner	Bishow
9	Model Developer	
10	Model Approver	
11	Model User	<p>&lt;p&gt;[1] Data source: Alzheimer's Disease Neuroimaging Initiative, &lt;/p&gt;&lt;p&gt;[2] Fayyaz Ahmad, Waqar Mahmood Dar, "Classification of Alzheimer's Disease Stages: An Approach Using PCA-Based Algorithm", &lt;/p&gt;&lt;p&gt;[3] Taeheo Jo, Kwangsik Nho and Andrew J. Saykin, "Deep Learning in Alzheimer's Disease: Diagnostic Classification and Prognostic Prediction Using Neuroimaging Data", &lt;/p&gt;&lt;p&gt;[4] Lucia Billeci, Asia Badolato, Lorenzo Bachi and Alessandro Tonacci, "Machine Learning for the Classification of Alzheimer's Disease and Its Prodromal Stage Using Brain Diffusion Tensor</p>

Overview

Model Inventory

Model Details

Model Information

Model Performance

Simulation

Data Distribution

Score Comparision

Performance

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

Current Report

# Model Visualization

Details of the Models

eethos ai

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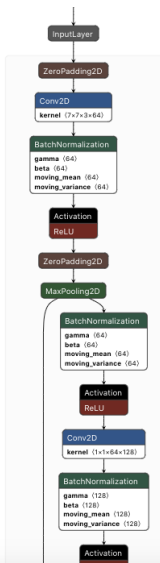
About

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Model Information





NODE PROPERTIES

type: ZeroPadding2D

module: tensorflow.keras.layers

name: densenet121/zero\_padding2d\_6

ATTRIBUTES

data\_format: channels\_last

dtype: float32

padding: [ 3, 3 ], [ 3, 3 ]

trainable: false

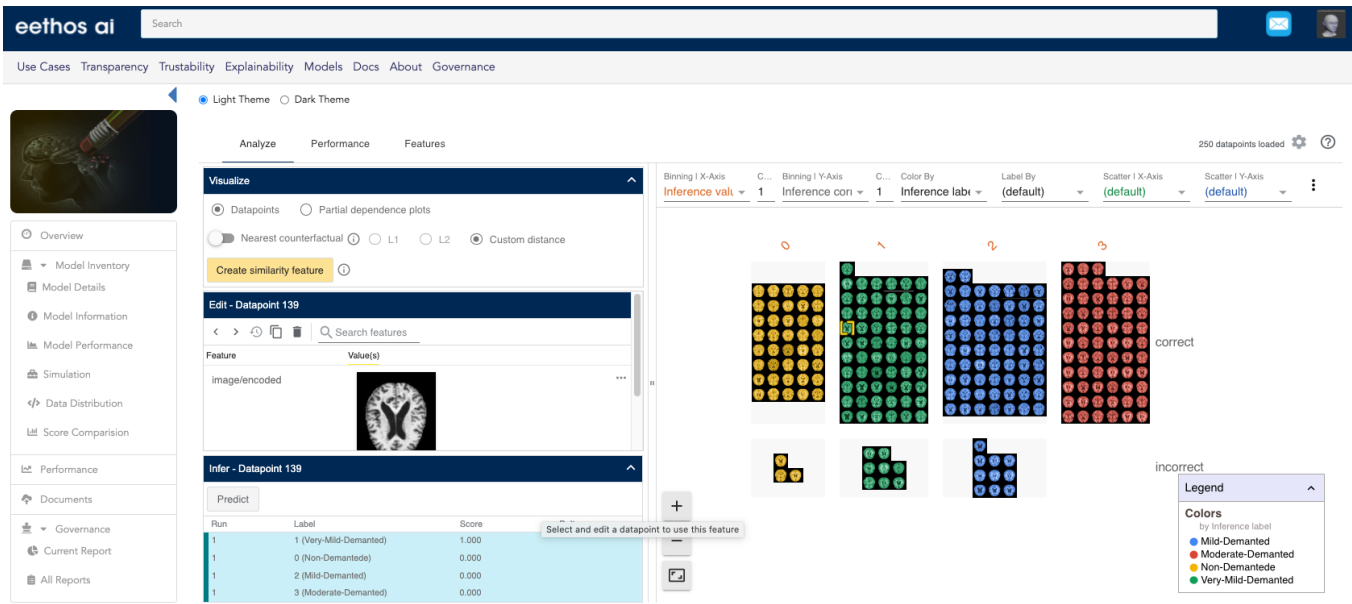
INPUTS

input: name: densenet121\_input

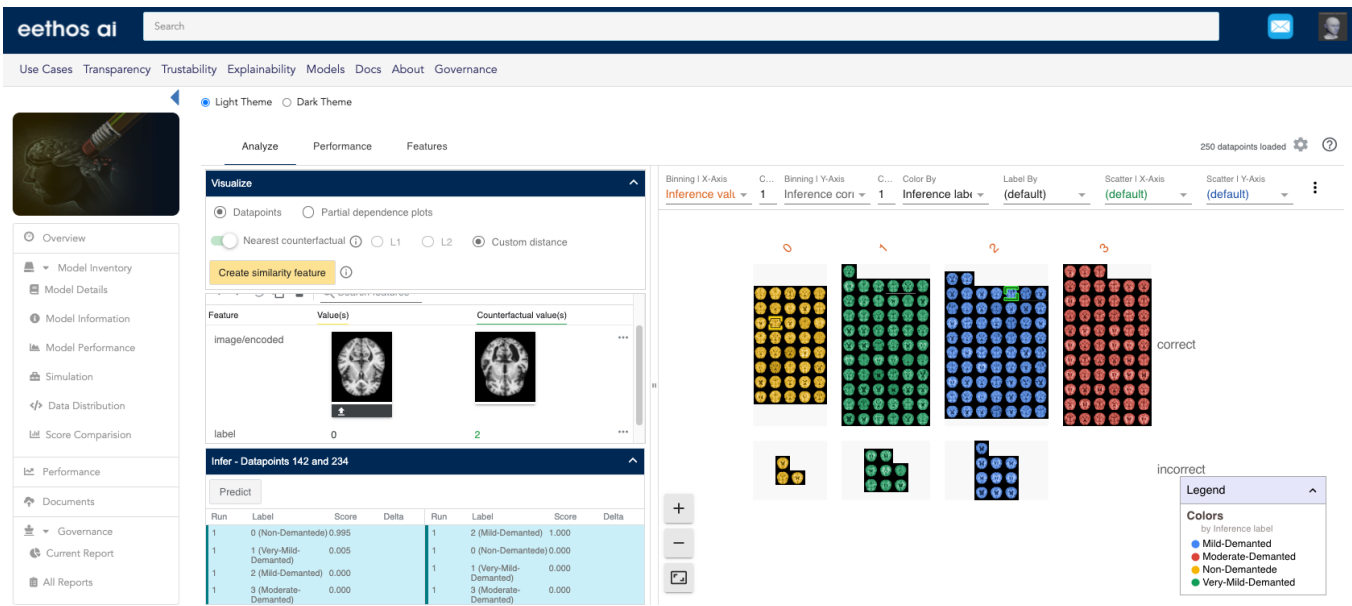
OUTPUTS

output: name: zero\_padding2d\_6

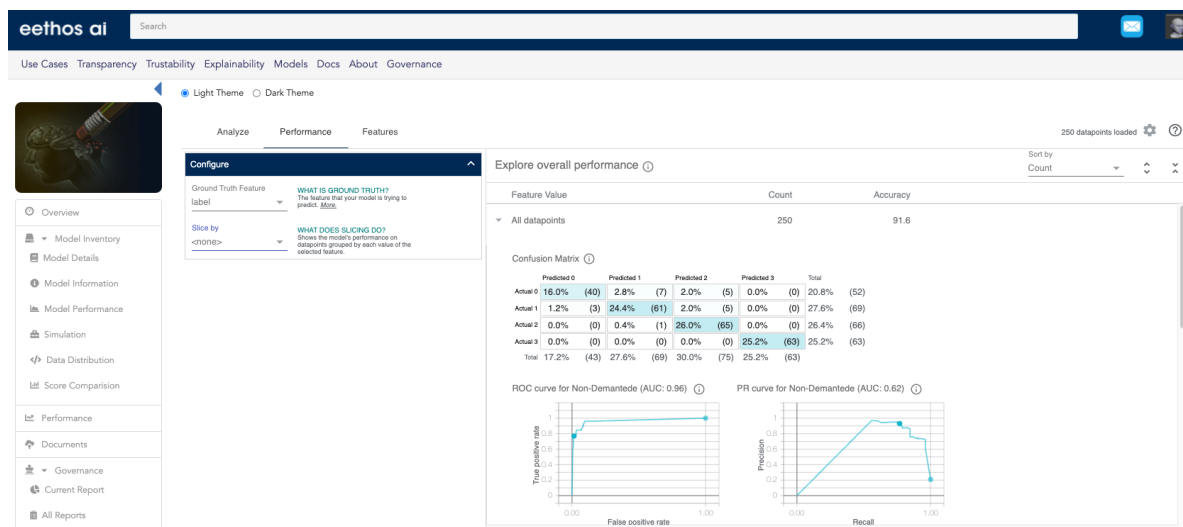
# Analyzing What if Scenarios?



## Analyzing







## References

- [1] C. (2020, November 26). What are the 4 stages of Alzheimer and their effects? CircleCare. <https://www.mycirclecare.com/4-stages-of-alzheimer-and-their-effects/>
- [2] Alzheimer's research reset. Science. (n.d.). Retrieved February 17, 2022, from <https://www.science.org/content/article/alzheimers-research-reset>
- [3] Data source: Alzheimer's Disease Neuroimaging Initiative
- [4] Fayyaz Ahmad, Waqar Mahmood Dar, "Classification of Alzheimer's Disease Stages: An Approach Using PCA-Based Algorithm"
- [5] Taeho Jo, Kwangsik Nho and Andrew J. Saykin, "Deep Learning in Alzheimer's Disease: Diagnostic Classification and Prognostic Prediction Using Neuroimaging Data"
- [6] Lucia Billeci, Asia Badolato, Lorenzo Bachi and Alessandro Tonacci, "Machine Learning for the Classification of Alzheimer's Disease and Its Prodromal Stage Using Brain Diffusion Tensor Imaging Data:A Systematic Review"