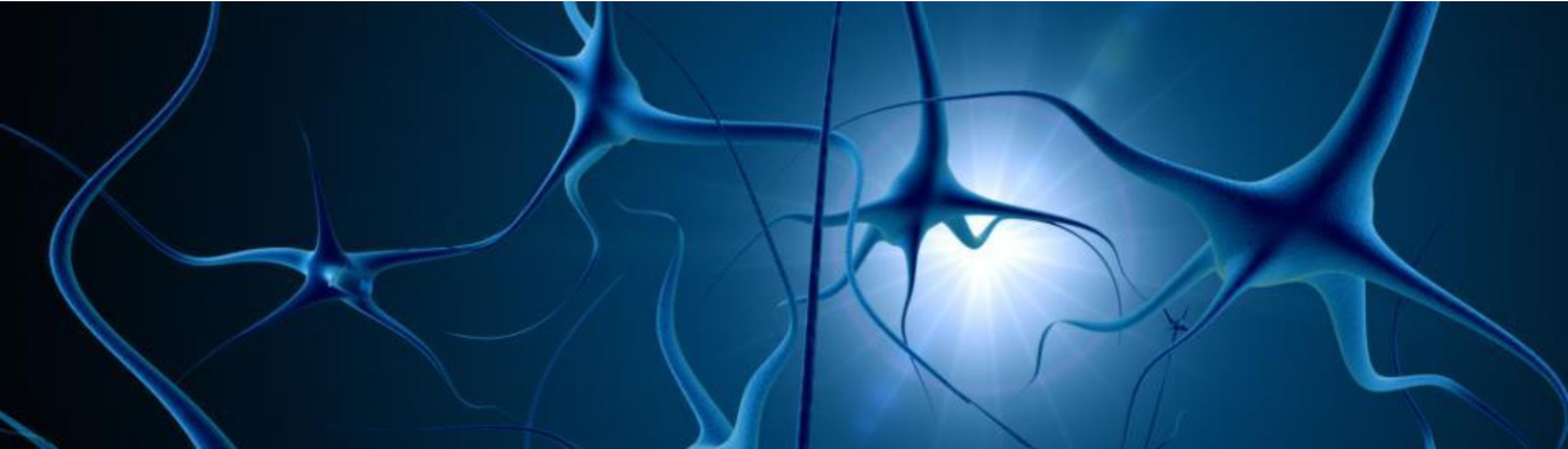




# **AI Revolution in Healthcare**

**Raymond Moh, Founder of Hanalytics.ai**



# AlphaGo - 3,000 Years of Human Knowledge in 40 Days



#Possible Moves =  $10^{170}$   
#Atoms in the universe ~  $10^{80}$



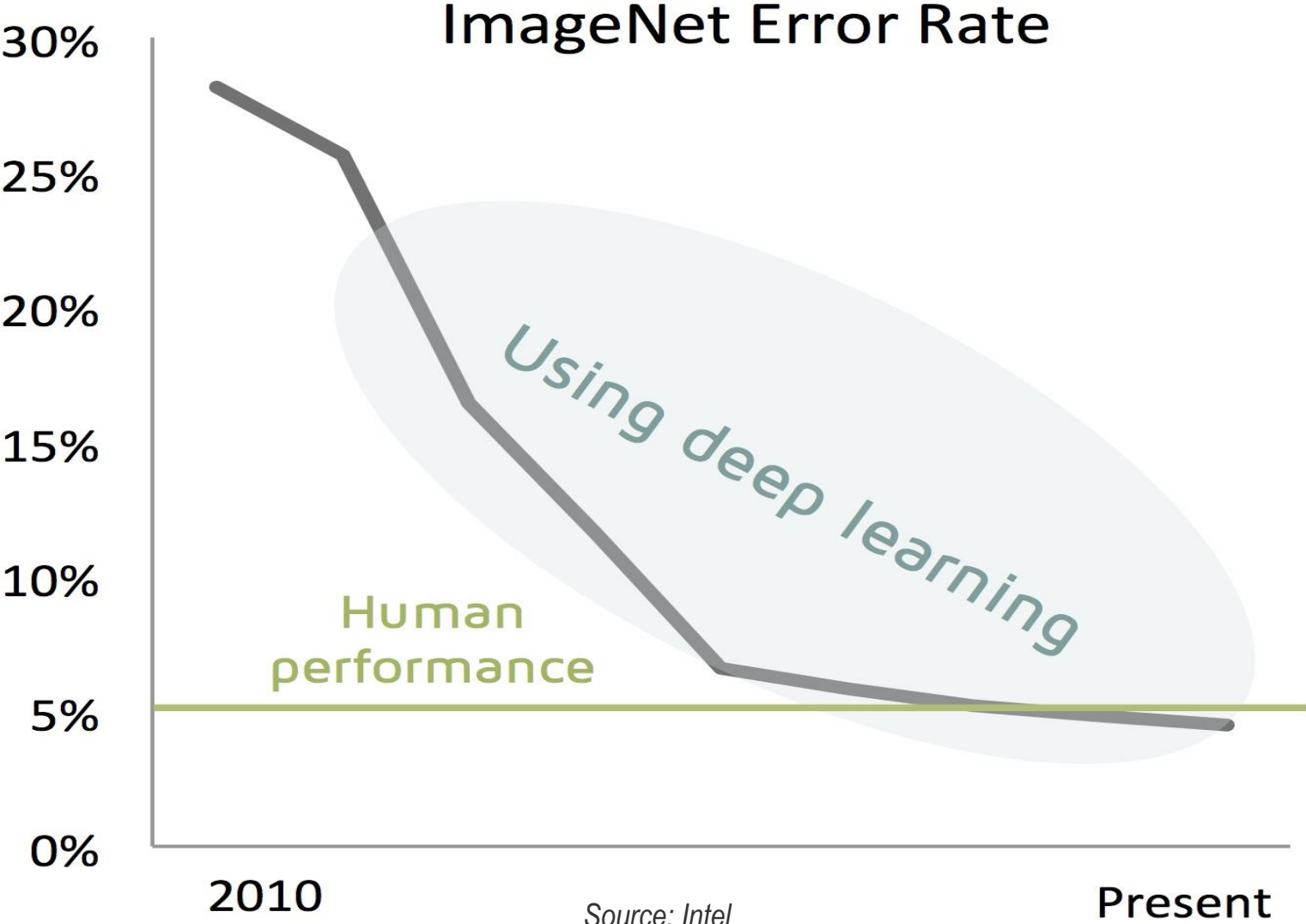
In 2016 AlphaGo beat Lee Sedol, 18-time world champion

In 2017, AlphaGo Zero, defeated AlphaGo Lee, in 3 days

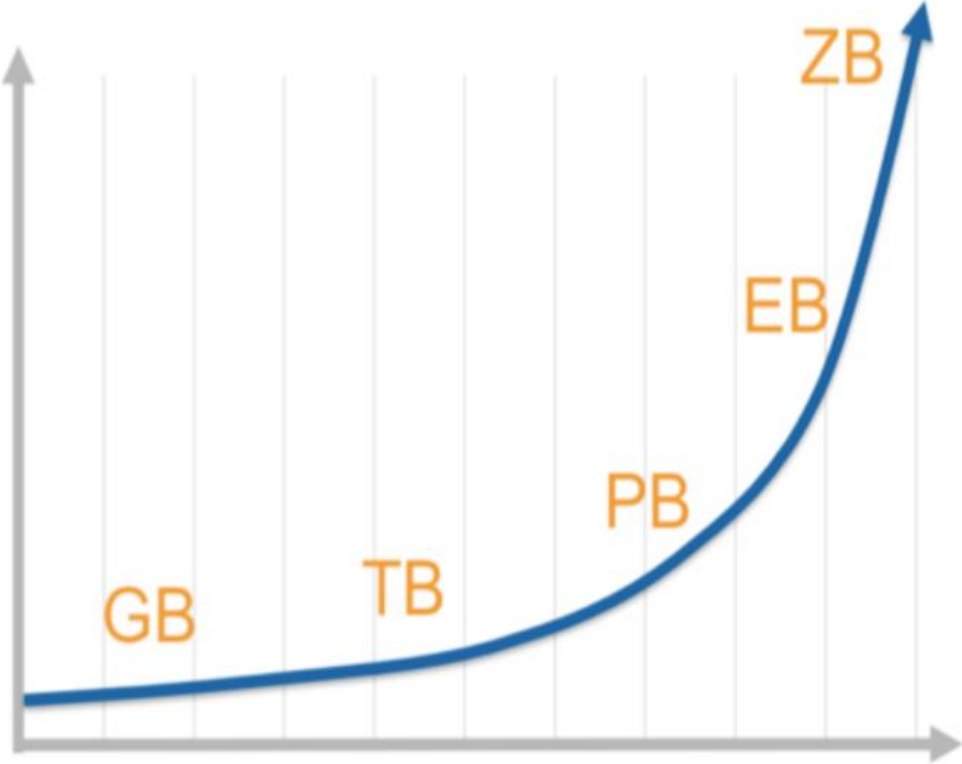
# Living with Artificial Intelligence



# Exceeding Human Abilities



# Exceeding Human Abilities



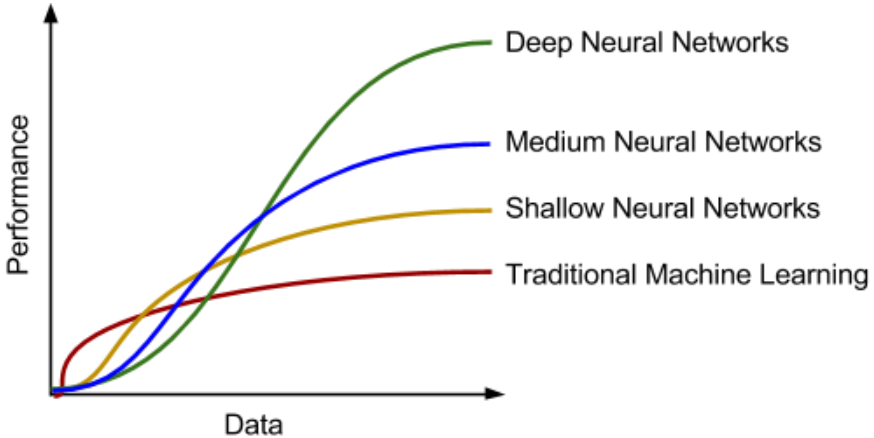
CPU



GPU



TPU



# Global Healthcare Challenges



## Rising Costs

Global healthcare spend projected to reach **\$8.7 trillion** by 2020

Healthcare spending in the world's major regions will increase from 2.4 percent to **7.5 percent** between 2015 and 2020


Cardiovascular disease costs continue to rise for **lower and middle-income countries**



## Access to Healthcare

At least **half of the world's population** cannot obtain essential health services, according to a report from the World Bank and WHO

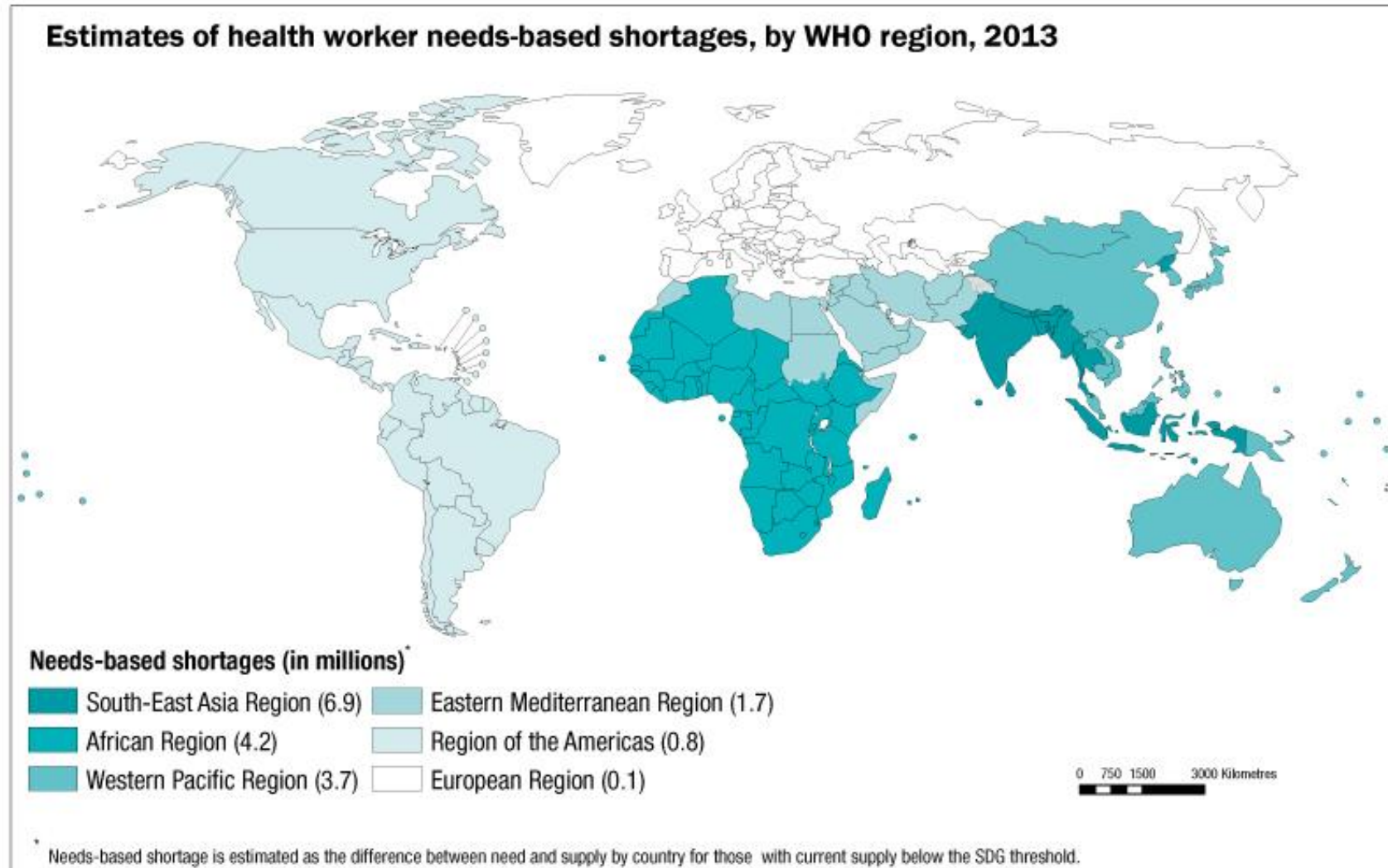
For almost **100 million people**, medical expenses are high enough to push them into extreme poverty, forcing them to survive on just \$1.90 or less a day



## Productivity Issues

Long waiting times have been linked to **inefficiencies in healthcare delivery, prolonged patient suffering and dissatisfaction among the public.**

# Global Shortage of Health Workers



It is estimated that the needs-based shortage of healthcare workers globally would be about **17.4 million** of which almost 2.6 million are doctors and over 9 million are nurses and midwives.



## Our Vision

Scale healthcare specialist expertise globally so that patients over the world can benefit from accurate diagnosis, lower costs, delivery speed and access.

**“Doctors can for the first time use the predictive power of deep learning to directly improve patients' medical outcomes and saving hospitals' both time and money”**



# Hanalytics' Artificial Intelligence Research Centre

## World's First AI Research Center in Neurological Disorders

"The use of Artificial Intelligence (AI) in neurological disease prevention, diagnosis, prognosis and recovery has unparalleled advantage over human doctors.

For this reason, there will soon be a technological revolution brought about by AI in the realm of neurological disorders."



CHANNEL NEWSASIA

THE STRAITS TIMES



# Our AI Applications



Prognosis

Diagnosis

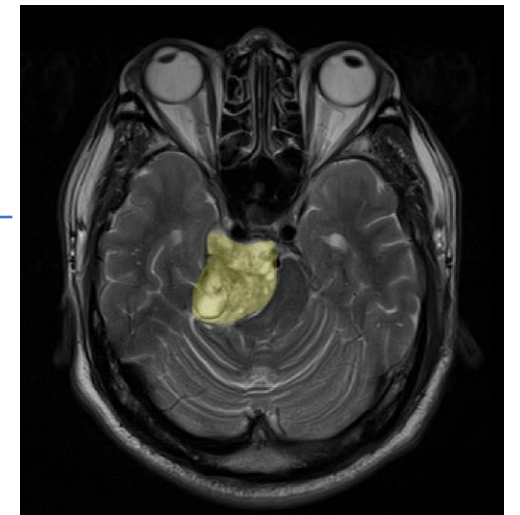
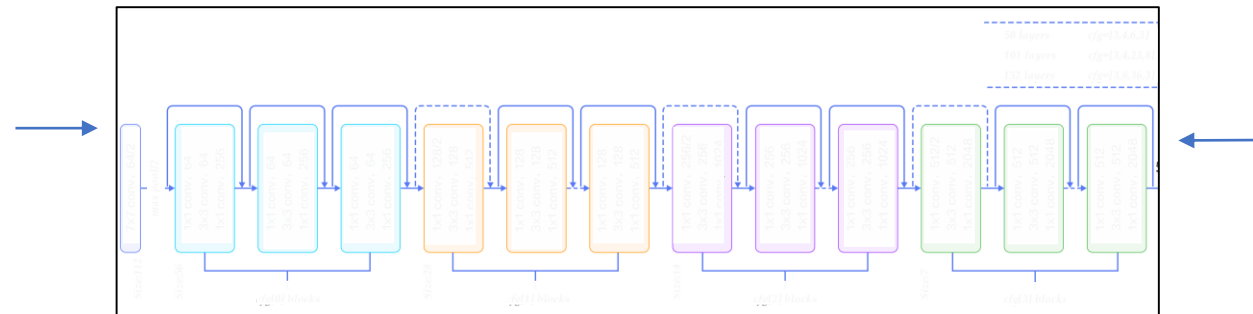
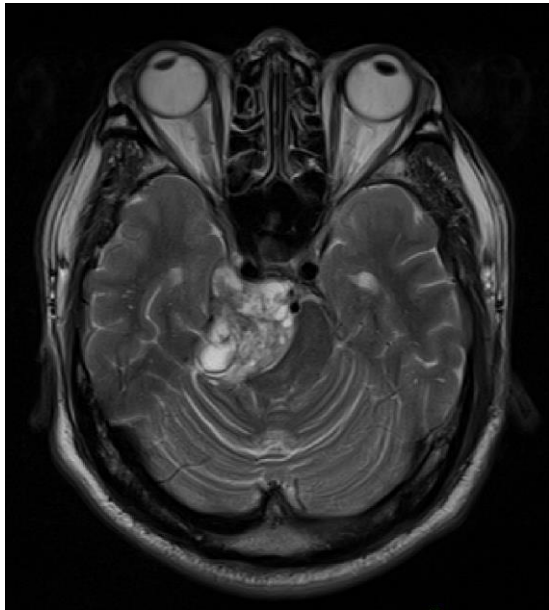
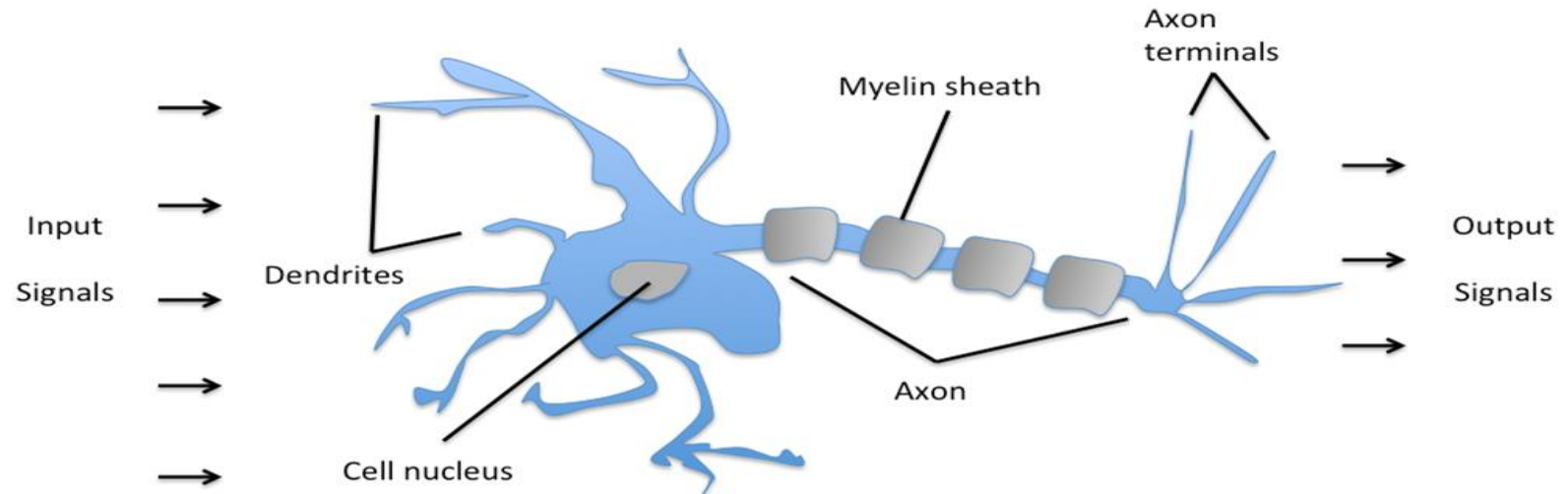


Treatment

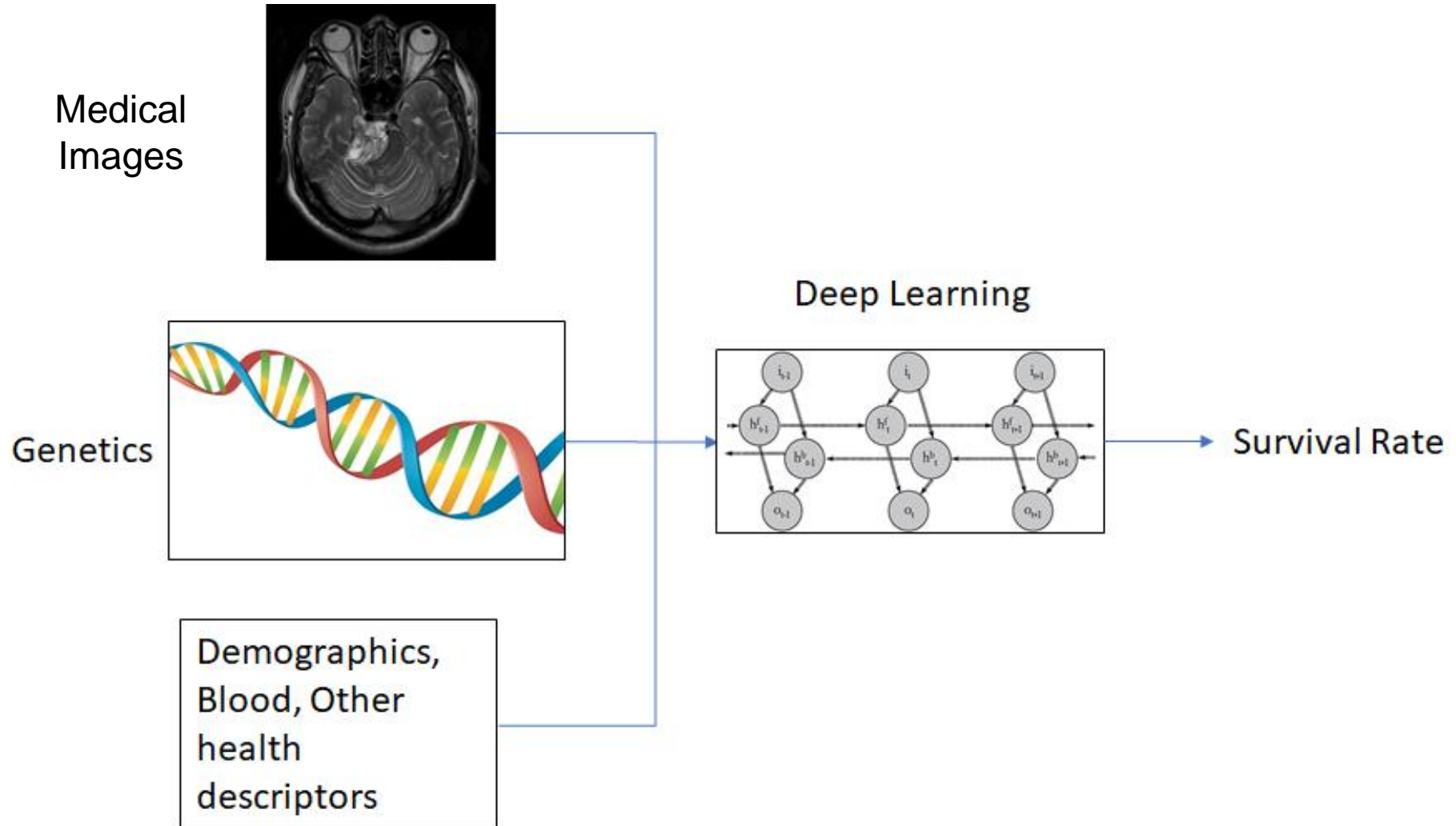
Recovery



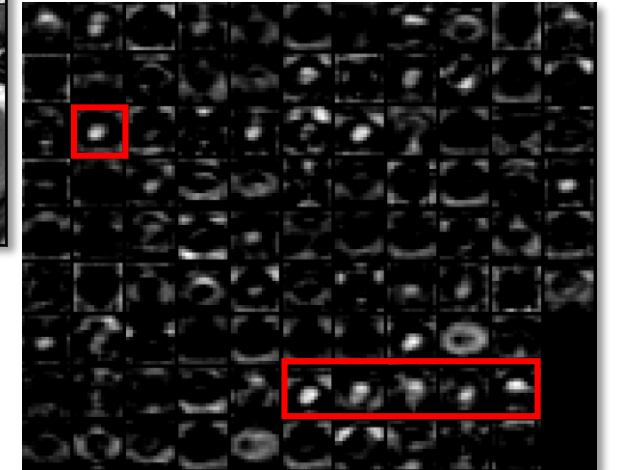
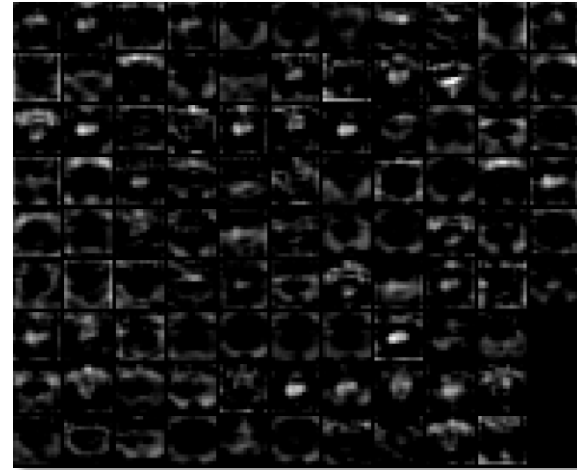
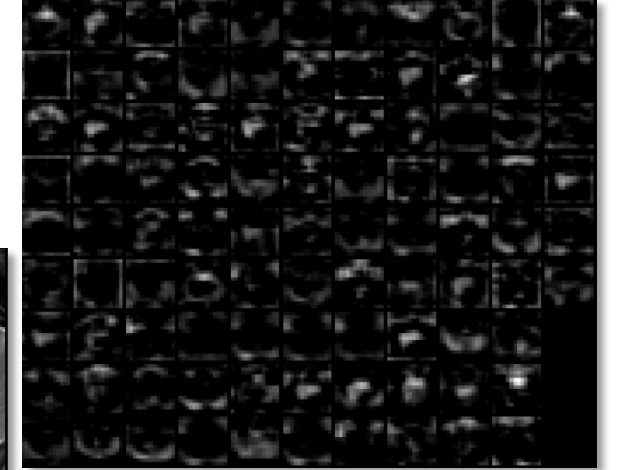
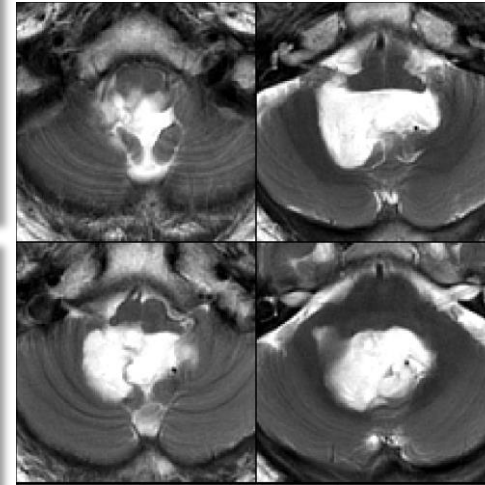
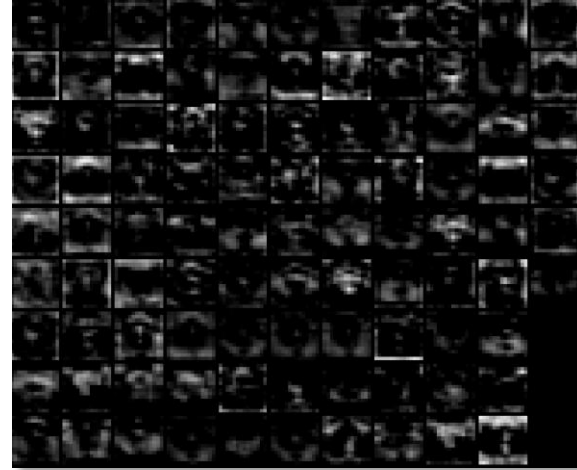
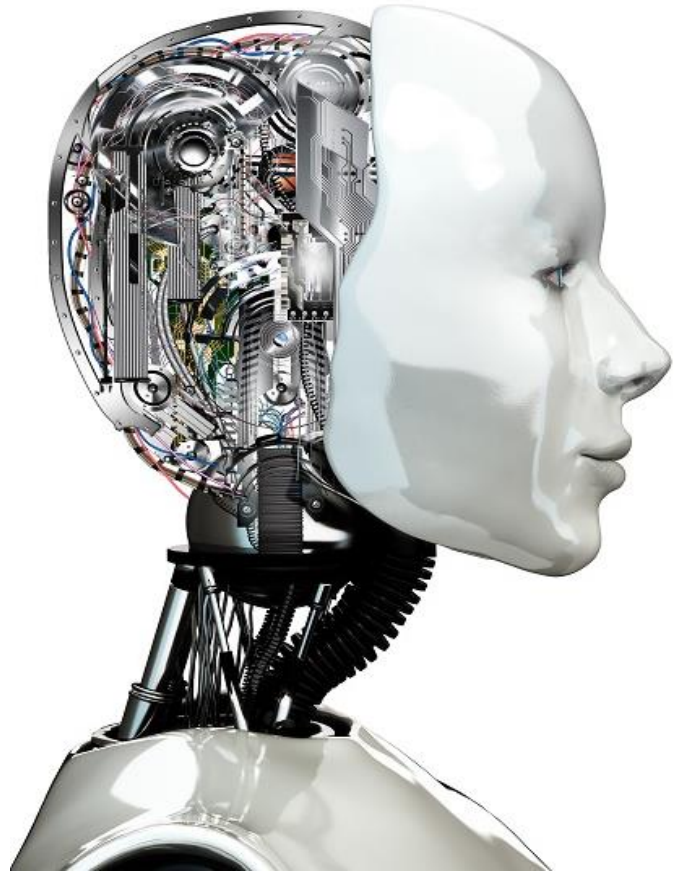
# Deep Learning to Learn Deeply



# Prediction of Survival Rates

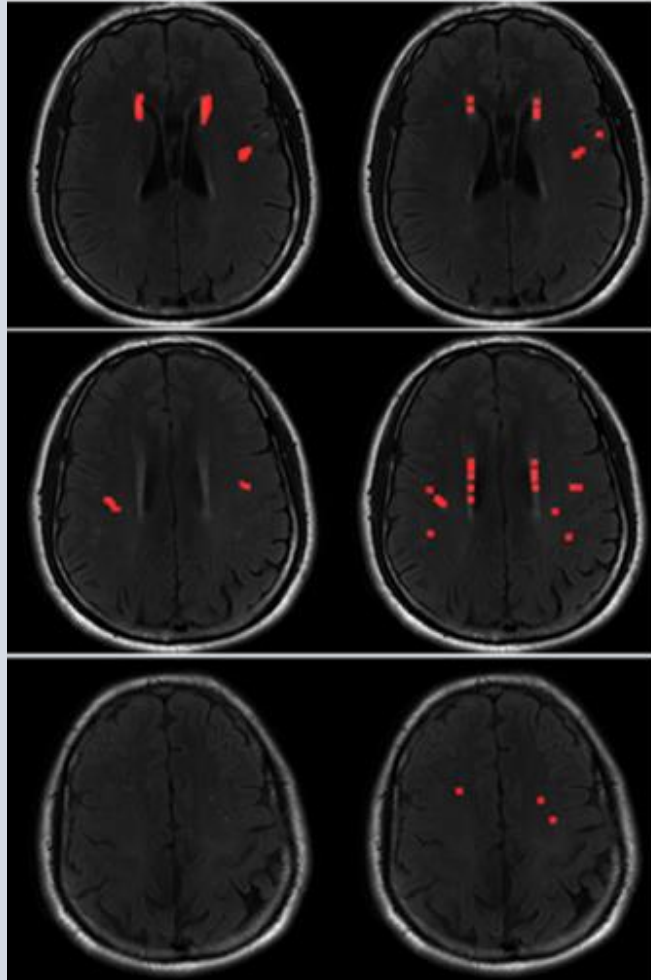


# Diagnosis of Tumors

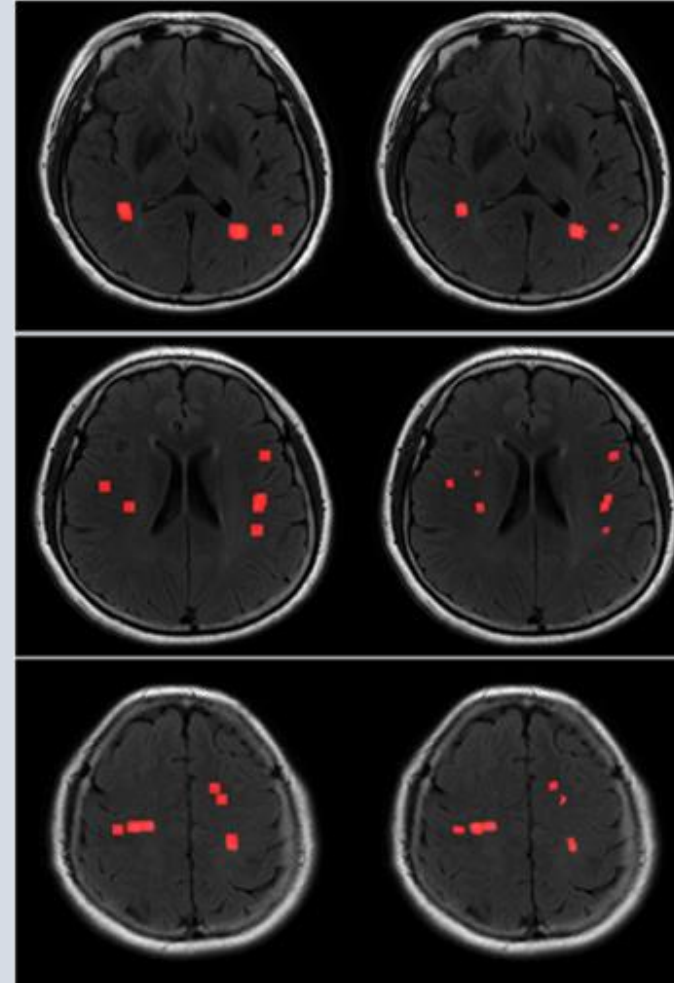


# Identifying Blood Vessel Diseases

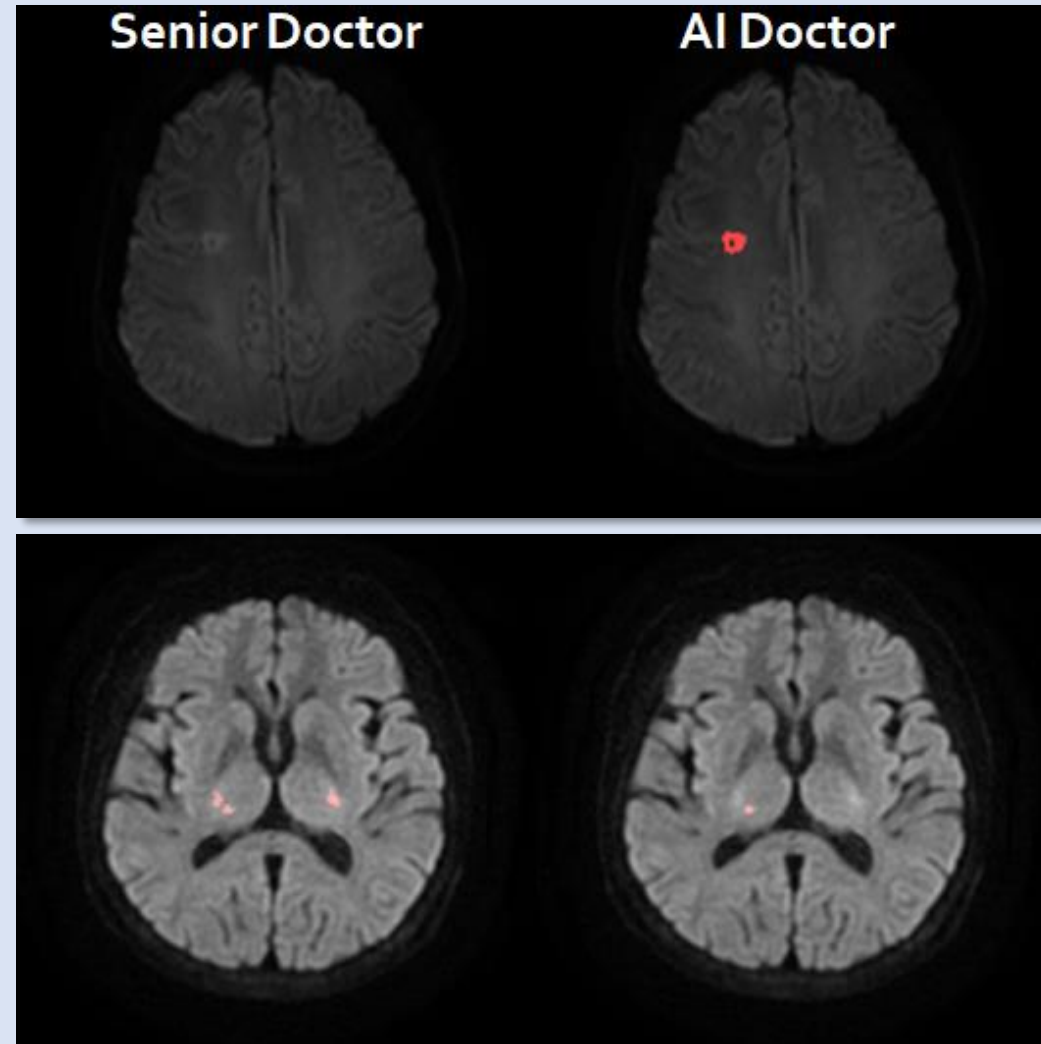
Senior Doctor      Avg. Doctor



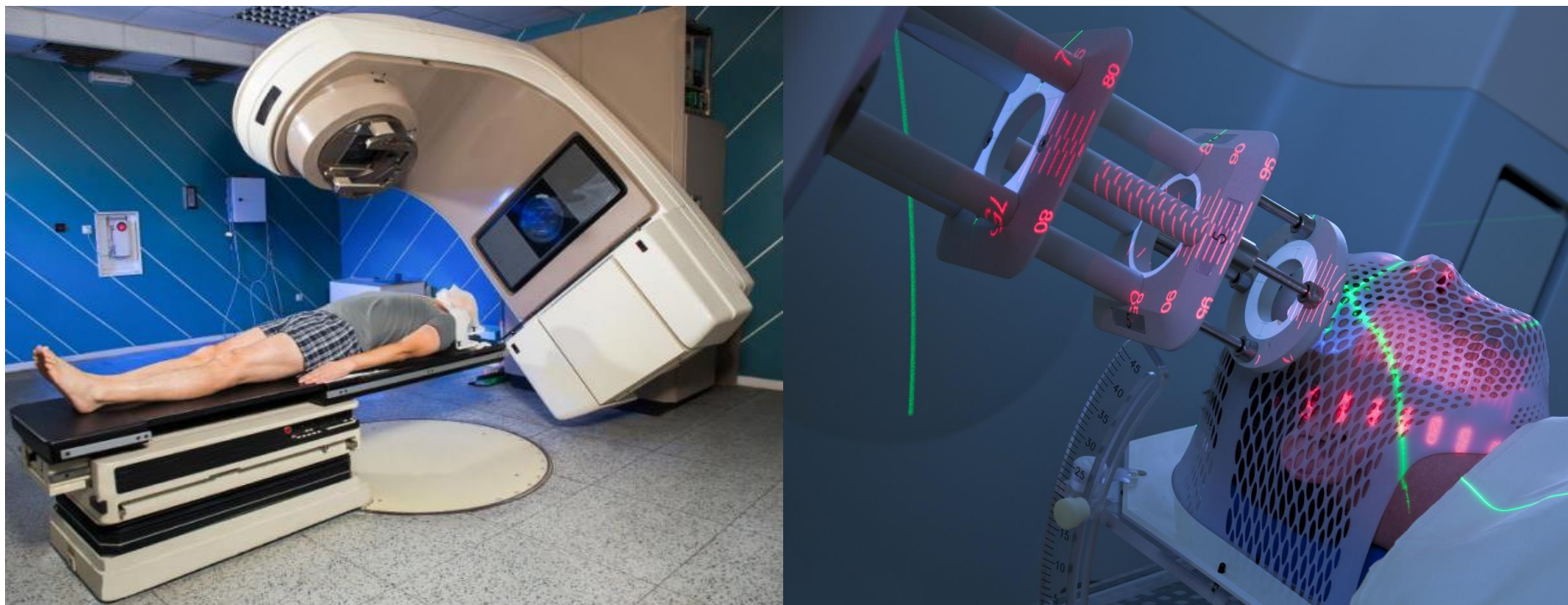
Senior Doctor      AI Doctor



# Identifying Blood Vessel Diseases

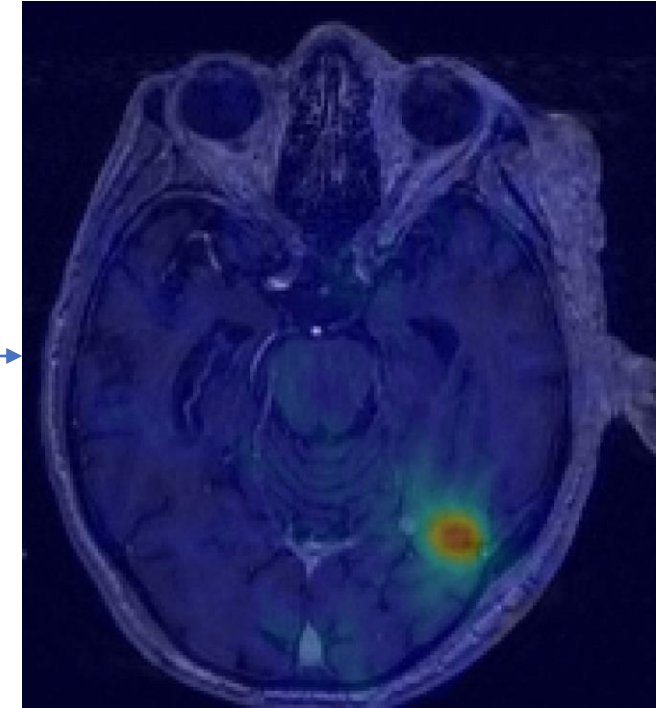
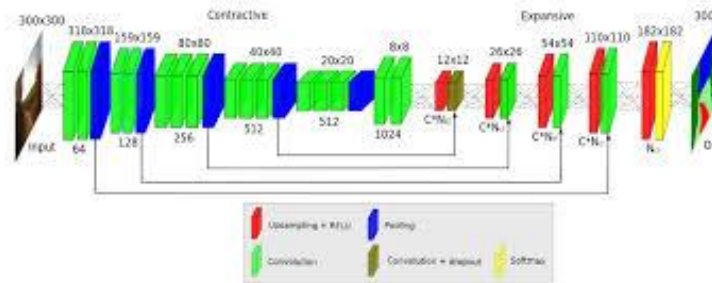
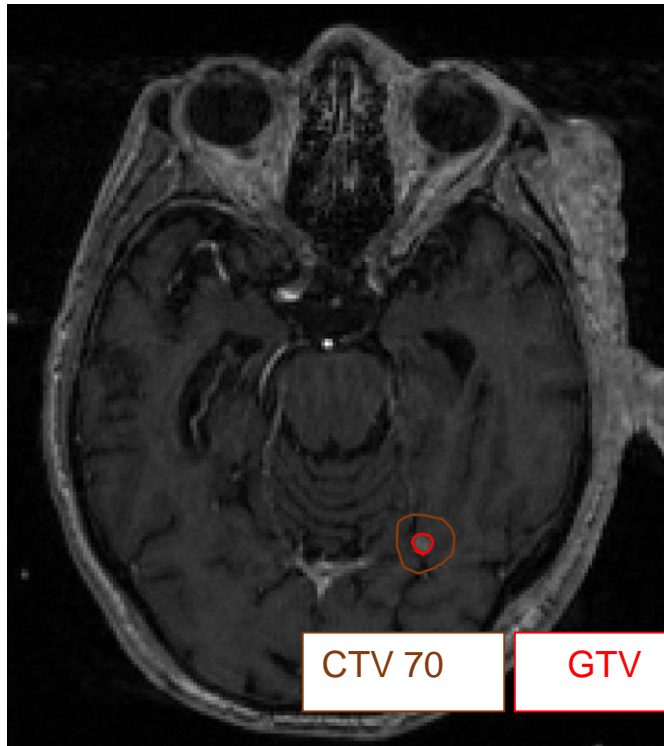


# AI in Radiotherapy





# AI in Radiotherapy



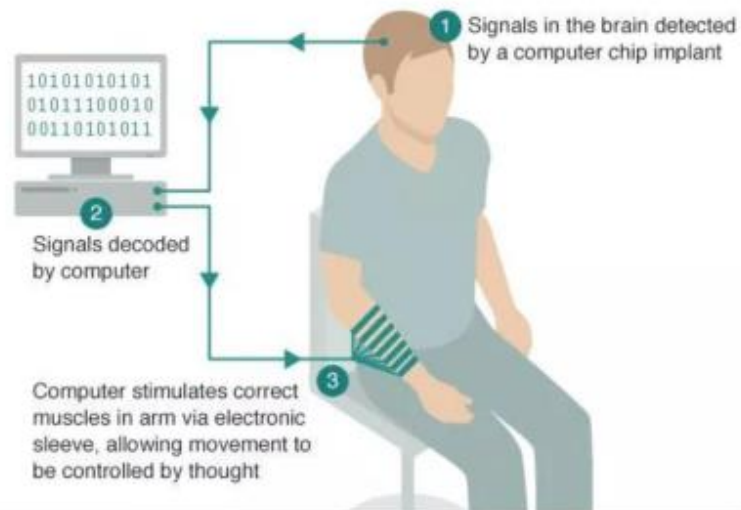
# Rehabilitation Robot – Reinforcement Learning

Existing rehabilitation processes are very uncomfortable for stroke or nerve-impaired patients.

The recovery process may be slow, and require extensive amounts of financial and material resources to sustain.

**With the application of Artificial Intelligence in the medical field, rehabilitation robots have been introduced to help patients regain mobility.**

How to move a paralysed arm

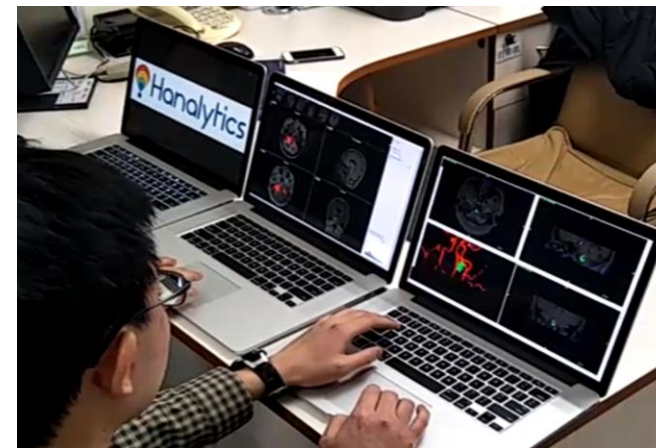
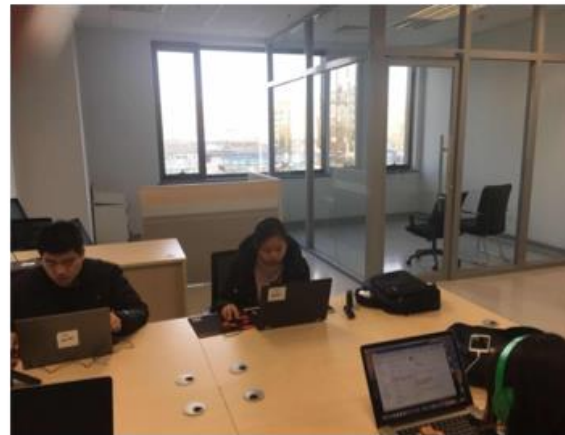


Source: Battelle/Ohio State University

BBC



# Our Presence





## Machine Learning Associate Program (MLAP)

### Who will impress us:

A strong technical individual with a geeky background like



Engineering



Computer Science



Physics



Mathematics

Loves Programming

Solves tough problems

Fascinated by Maths and Physics

Wants to learn Artificial Intelligence  
and build deep learning models

### Some of the things you will learn:

Computer vision /  
image segmentation,  
Localization,  
Classification

Deep learning techniques,  
Research techniques,  
Paper writing

Tensorflow or  
Theano or  
Torch

Python, C++  
or Java

Numpy, Pandas,  
Sklearn, Scipy,  
Seaborn

Building deep learning  
models like RNN and  
CNN and other neural  
network models

### Desired education:

Bachelor / Master / PhD in Engineering or Computer Science or Mathematics or Physics  
Machine learning background is not a requirement.

# What We Offer

## Learn and Master

The opportunity to work with, learn from and share knowledge with uber- smart colleagues in a culture of collaboration and technical excellence.

## Progression Path

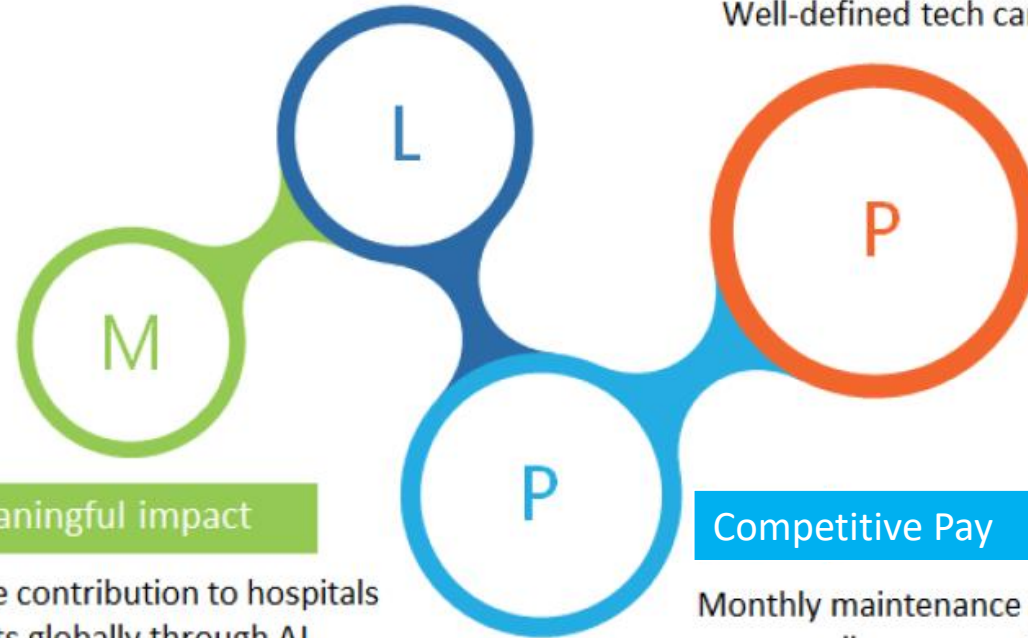
Well-defined tech career progression path.

## Make a meaningful impact

Make a positive contribution to hospitals and patients globally through AI.

## Competitive Pay

Monthly maintenance allowance, overseas allowance, return airfare.



[www.hanalytics.ai](http://www.hanalytics.ai)

THANK YOU

