



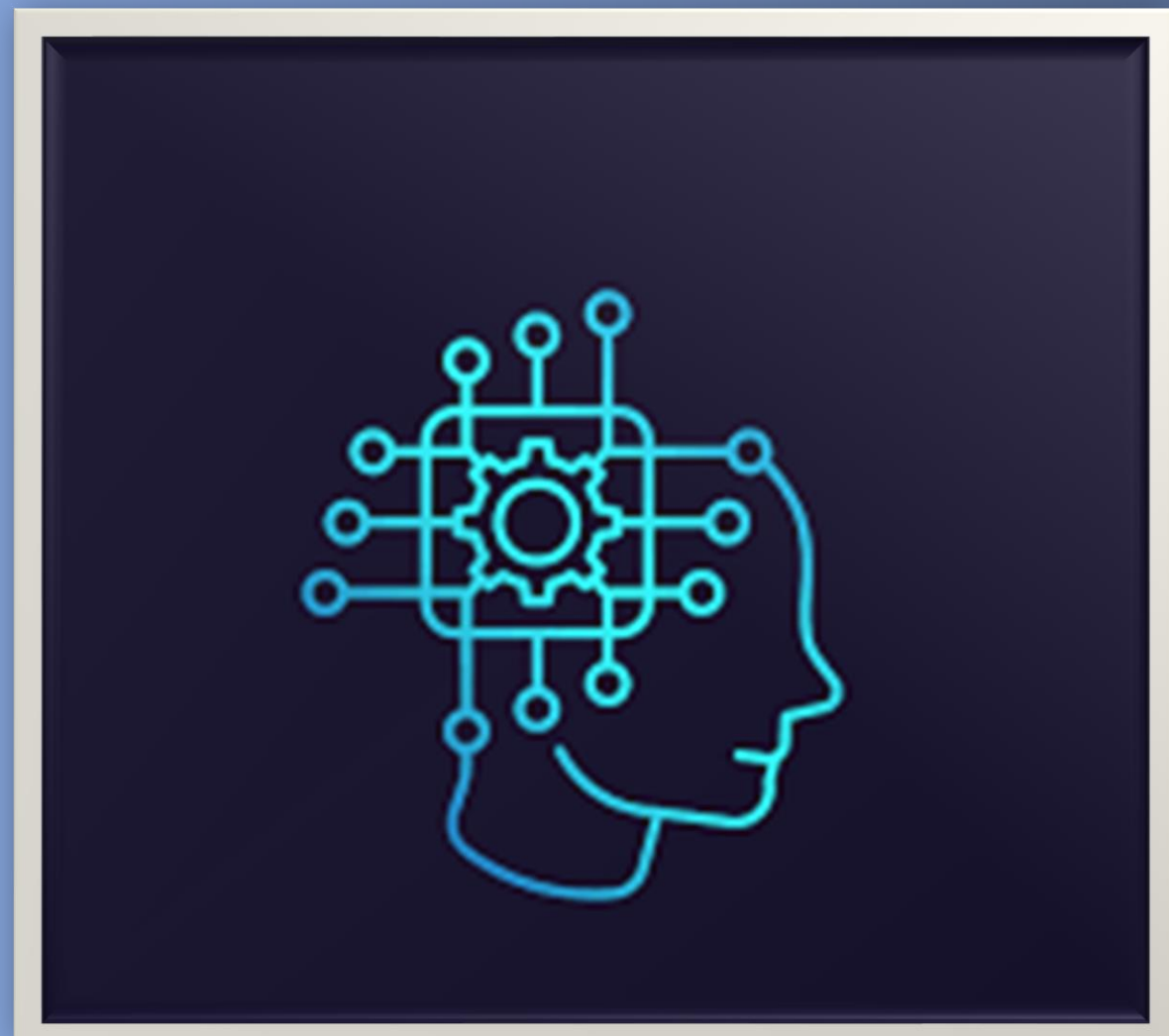
# Future of Artificial Intelligence in Radiology

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## What Is Artificial Intelligence?

Defined as the science and engineering of intelligent machines.

AI uses networks of databases and other complex functions that teaches the computer to perform task previous believed to require human cognitive function



(stockphotos.com,2018)

## AI in the Status Quo

AI is all around us ranging in autonomous automobiles and aircraft, to a variety of economy market forecasting, and even down to virtual assistant on your phone or watch.

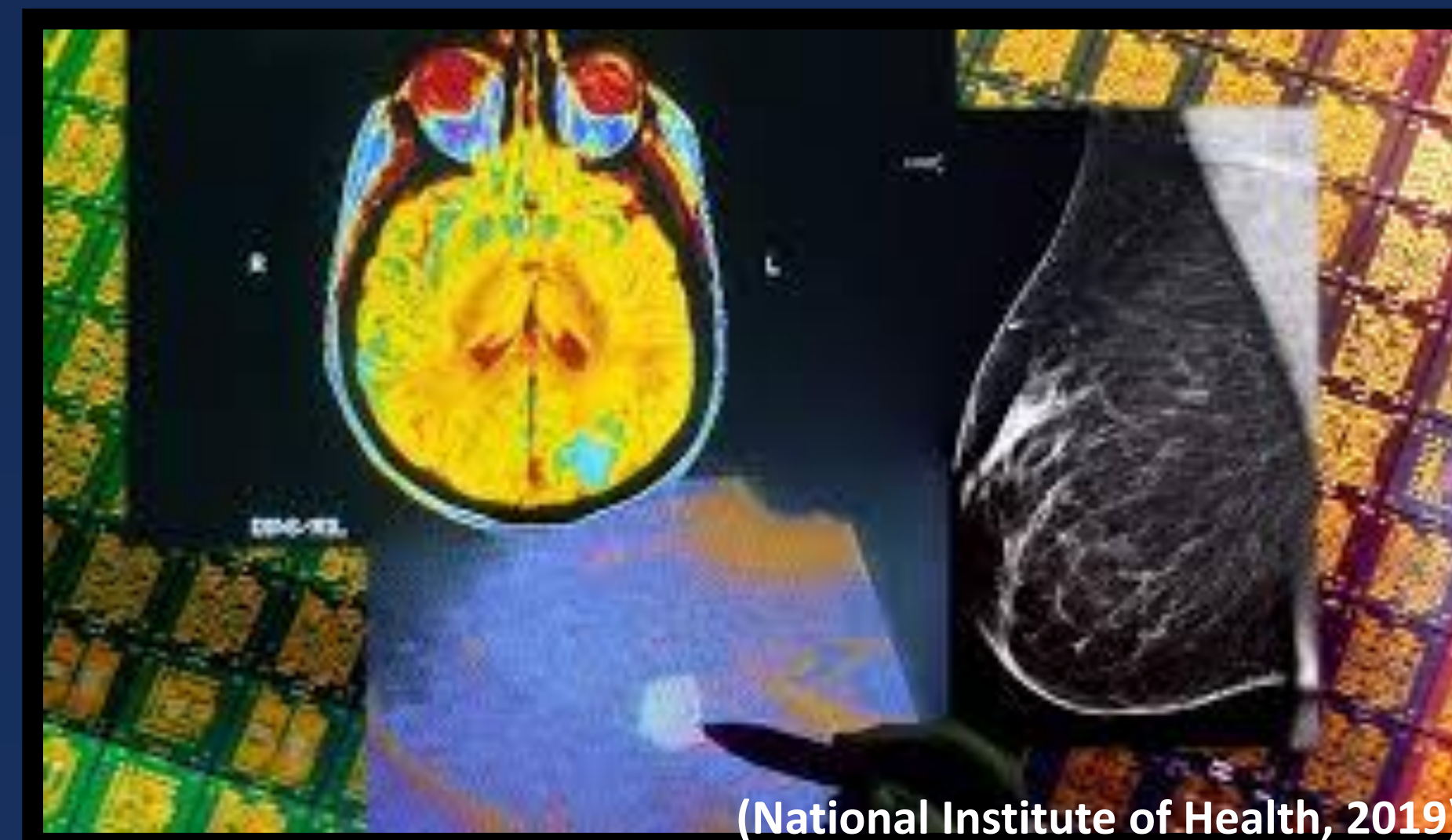


“AI has the potential to enhance our profession and transform the practice of radiology worldwide”  
RSNA President Vijay Rao, MD

## AI In Medical Practice Today

We can see the earliest forms of aid of artificial intelligence in cardiology. Slomka, a research and development lab, integrated nuclear medicine data and CT angiography imaging and developed methods to enhance detection of abnormalities and signs of disease.

Areas in radiology and radiation therapy use AI software programs that consist of a process called computer-aided-detection (CADe). The program is able to detect disease in specific areas of the body, such as breast cancer in mammography. CADx is a diagnosing program that aids in treatment and assesses the severity of cancers. The work of CADe and CADx coincide with radiologists; it delivers its interpretation for the radiologist to make a final analysis.

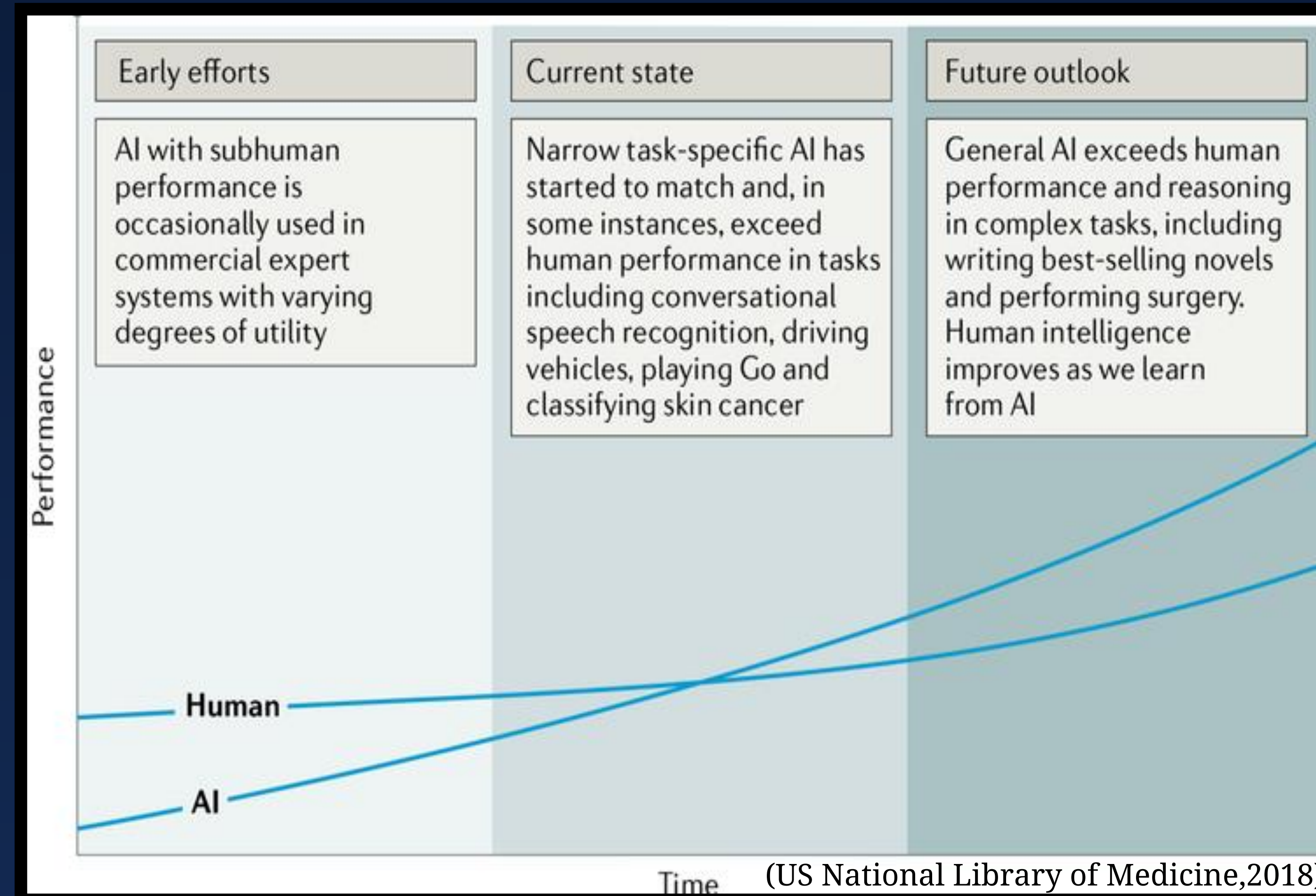


(National Institute of Health, 2019)

There are many installments of AI that are not directly involved in diagnosing but increase efficiency in workflow such as:

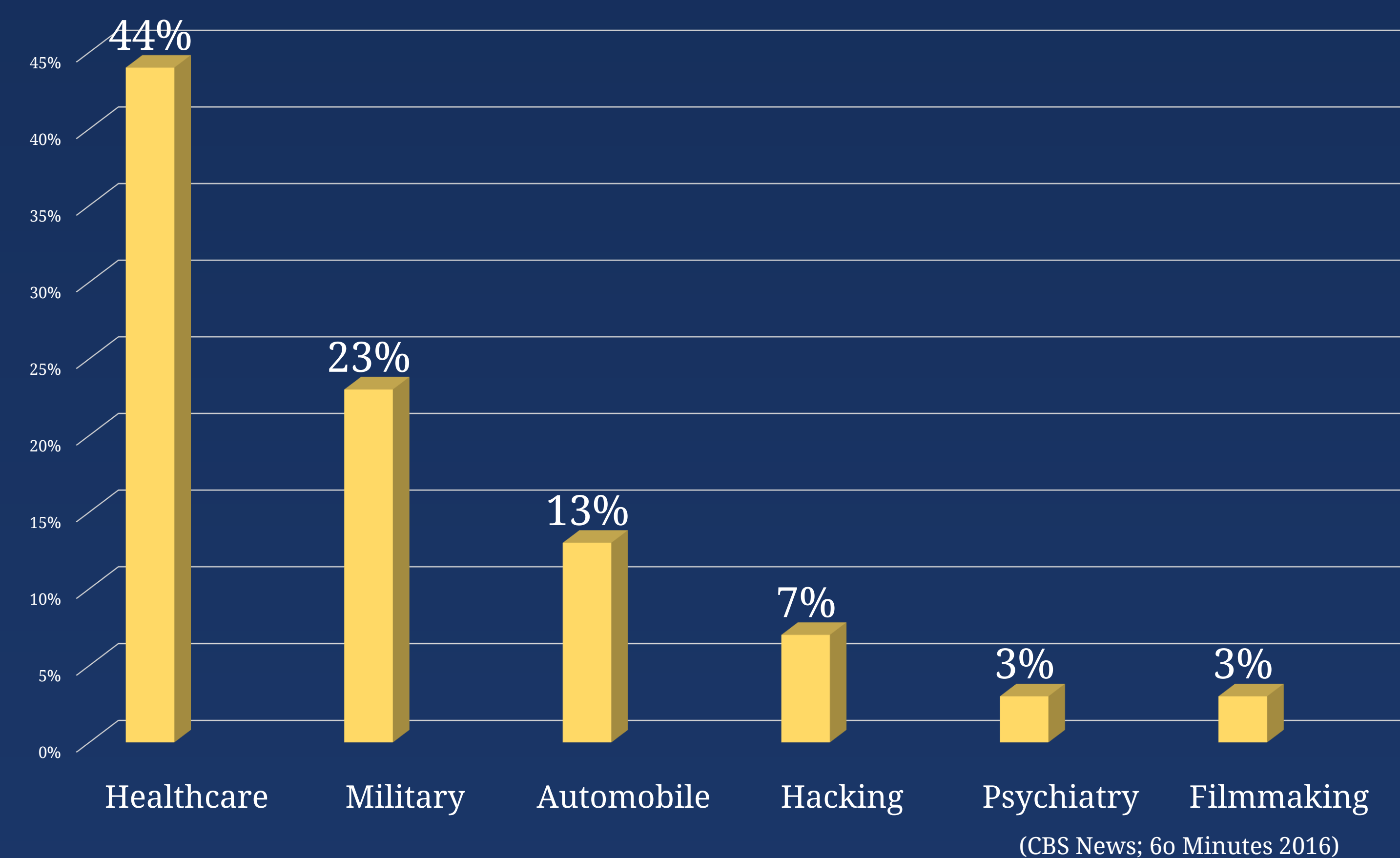
- Auto positioning in CT that saves time in repetitive and physical tasks.
- Auto machine maintenance that allows for various machines to display specific maintenance required.
- Automatic image slicing in MR that decreases redundant steps the technologist typically takes.

## Near future developments



The rate of growth and AI and computer advances are parallel according to the United States National Library of Medicine. The growth rate is depicted to be exponential and reaching a point of singularity as early as 2022. At this point, machines will learn and perform beyond human comprehension. Until the point of singularity comes, we will continue to see an increase in integration and breakthroughs not only in medicine, but in every field imaginable.

## Which Field Will Benefit Most from AI?



## Challenges

There are physical and ethical challenges that AI brings forth. Physically, the computing power to create these highly complex machines are yet to be engineered. Current healthcare facilities use private databanks, which is severely constricting these data hungry machines. For AI to properly work, there needs to be a universal databank with secure data infrastructure. With a universal databank there poses an ethical dilemma: Who is responsible for the data; Who can use the data; What happens to those who don't share the data? A healthcare policy reform is also needed since sensitive patient information needs to be shared. With these questions yet to be answered and physical computer limitations, AI advancements proves to be challenging.

## Conclusion

Although AI has major obstacles to overcome, we see the great tasks it is doing for us every day from predicting the weather, to aiding in the detection and treatment of deadly diseases. There is great potential in medical AI in the foreseeable future.

## Acknowledgements

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Webb, L., Bonincontri, L., Naine, P., Lopes, R., DuGal, T., Wilson, D., & Odle, T. (n.d.). The Artificial Intelligence Era: The Role of Radiologic Technologists and Radiation Therapists (White Paper). Albuquerque, NM: ASRT Foundation.