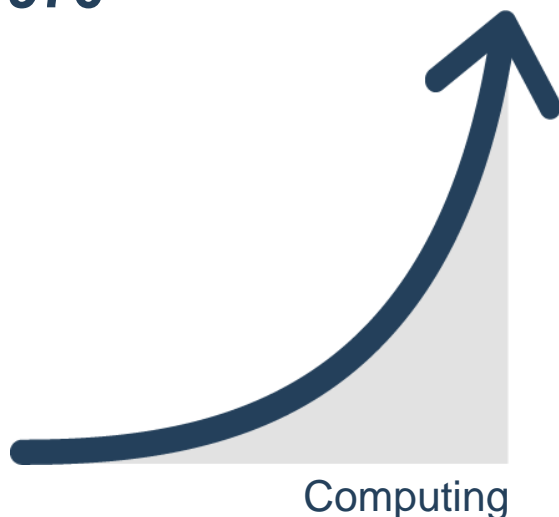# Swiss Hearing Day 2021

The new era of hearing acoustics, DNN, Artificial Intelligence in audiology

Exponential growth accelerates breakthroughs in Tech
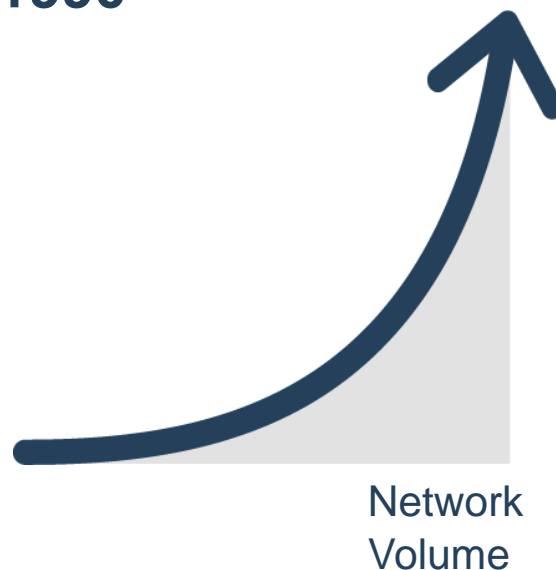
1970

Computing

1990

Network Volume

Today

Knowledge

Data

Moore's law

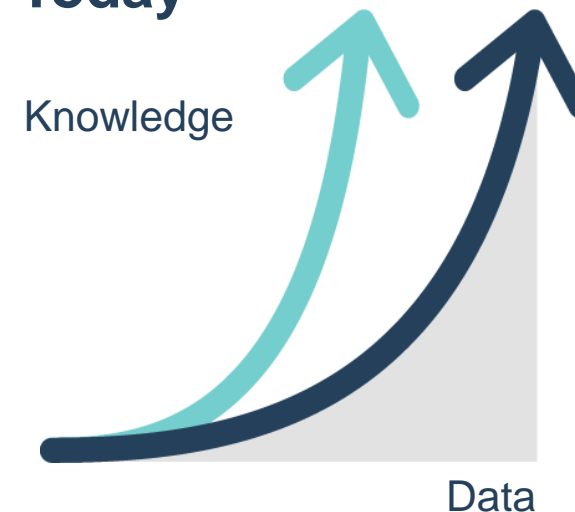The observation that the number of transistors in dense IC doubles about every two years

Metcalfe's law

The effect of a network is proportional to the square of the number of connected users

"Watson's" law

Take data, add AI to it and get exponential learning; ability to out-learn everybody else
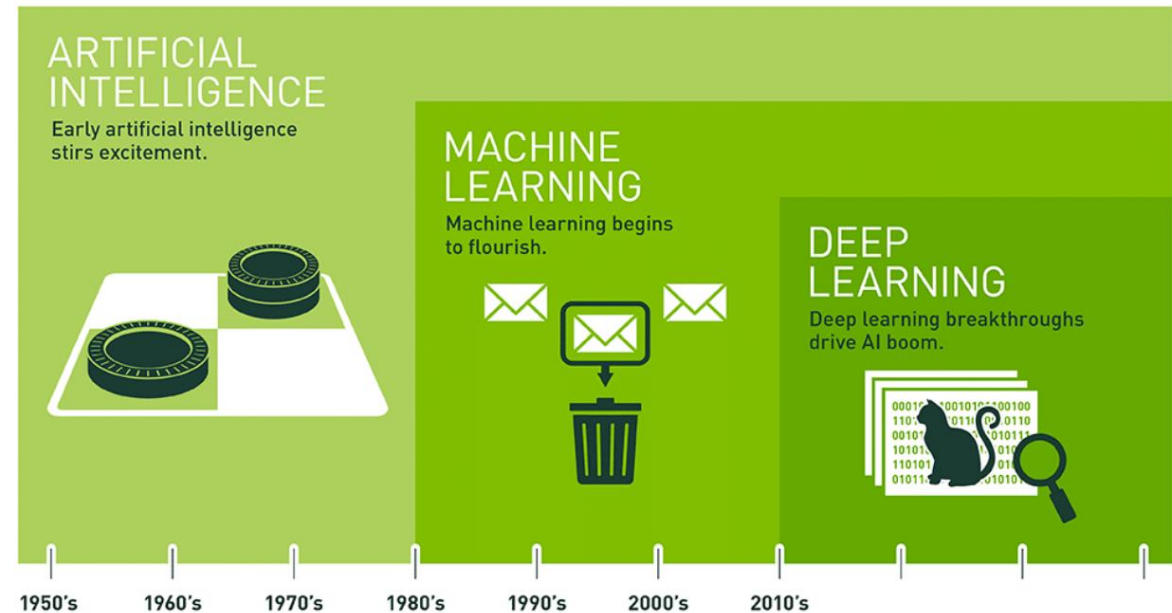
Definitions

Artificial Intelligence

- Artificial intelligence leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind

Deep Neural Network

- a technology built to simulate the activity of the human brain – specifically, pattern recognition and the passage of input through various layers of simulated neural connections

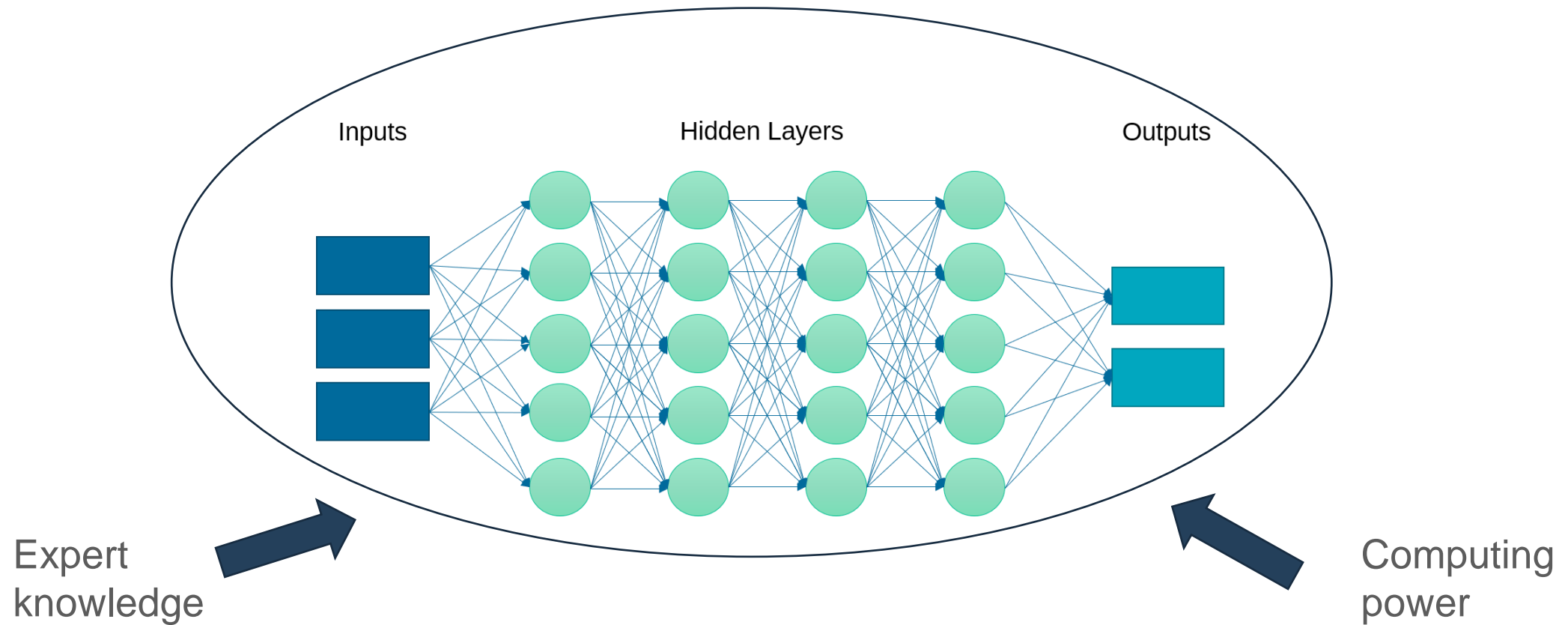
ARTIFICIAL INTELLIGENCE
Early artificial intelligence stirs excitement.

MACHINE LEARNING
Machine learning begins to flourish.

DEEP LEARNING
Deep learning breakthroughs drive AI boom.

1950's   1960's   1970's   1980's   1990's   2000's   2010's

AI processing can work wonders

Example old photo restored/enhanced with AI

Deep neural network

Inspired by the brain

Inputs

Hidden Layers

Outputs

Expert knowledge

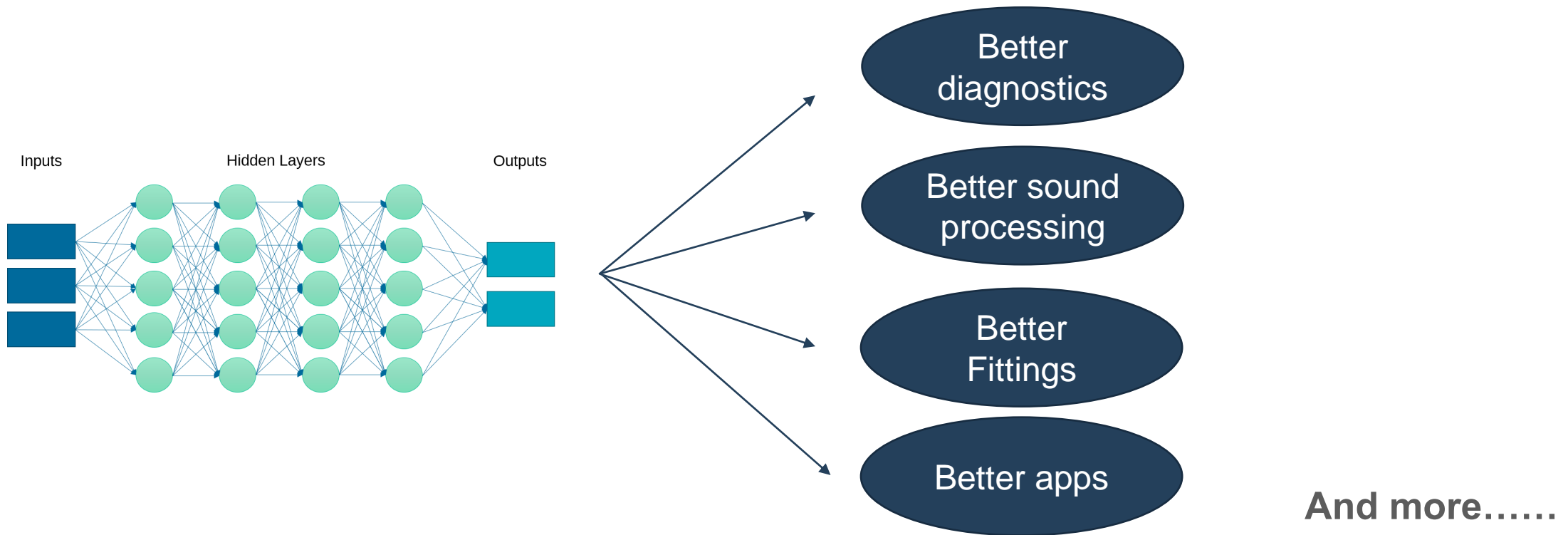Computing power

DNN Neural Sound Processing

Spoken words (Danish): "Venstre – Højre" in babble noise

- Enhanced (blue)
- Preserved (white)
- Attenuated (red)

More detailed sound map
- Larger contrast between clear sound and the background
- Blue – more information provided by the sound enhancer
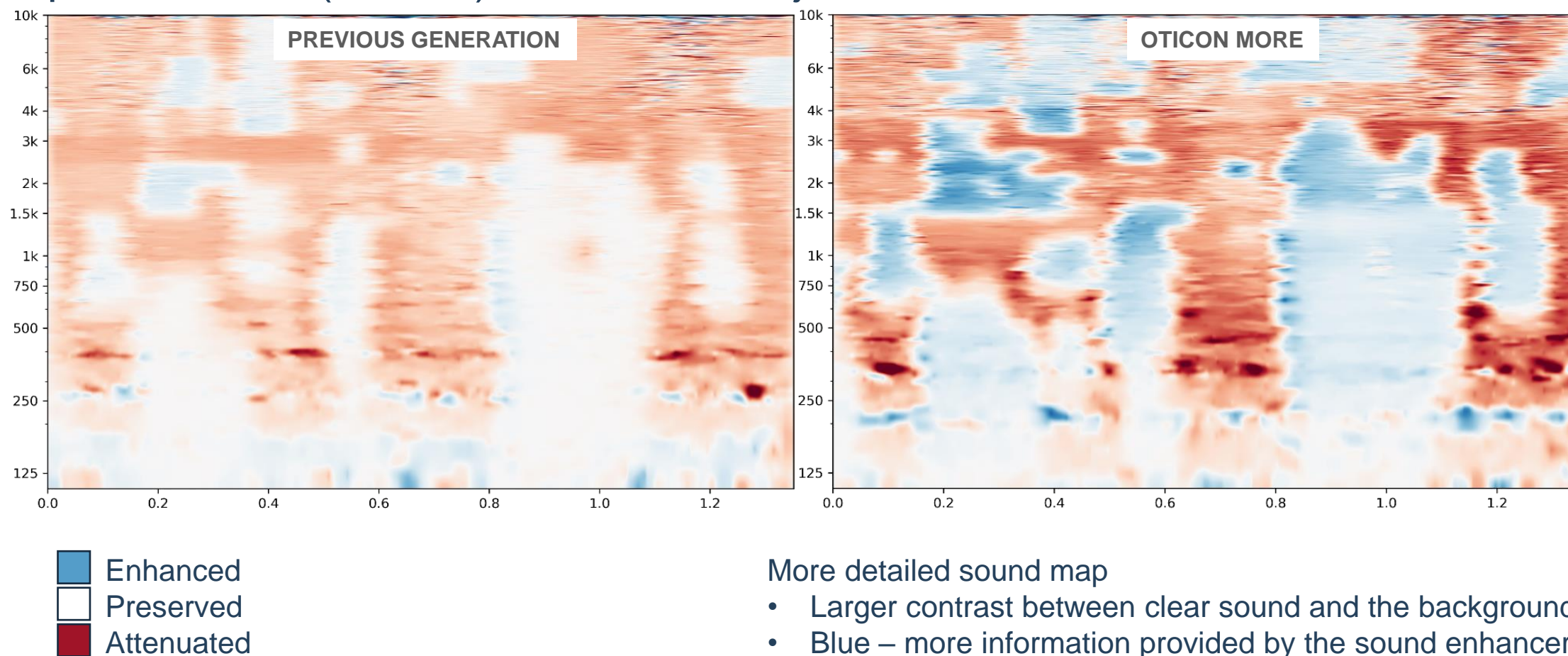
DNN will ignite new innovations

Inputs   Hidden Layers   Outputs

Better diagnostics

Better sound processing

Better Fittings

Better apps

And more……

Demant

Thank you