COMP250: Artificial Intelligence

11: Deep Learning

FALMOUTH
UNIVERSITY

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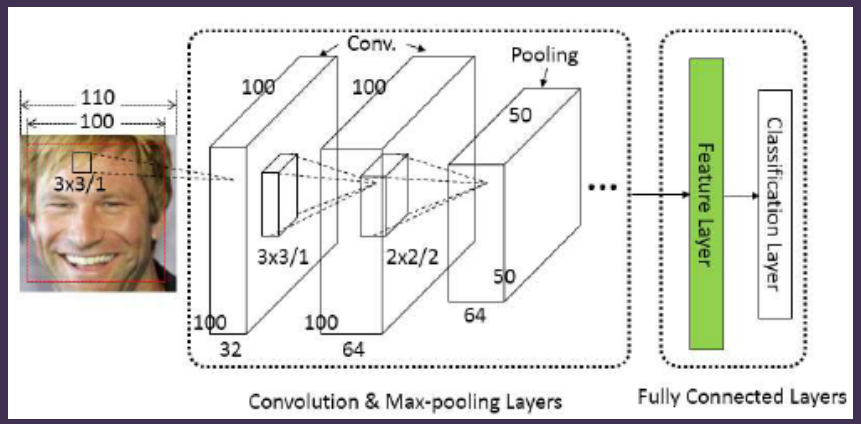
- Often uses **large training sets**
- Training often uses powerful **GPUs** — many times faster than training on the CPU

Convolutional Neural Networks (ConvNets)



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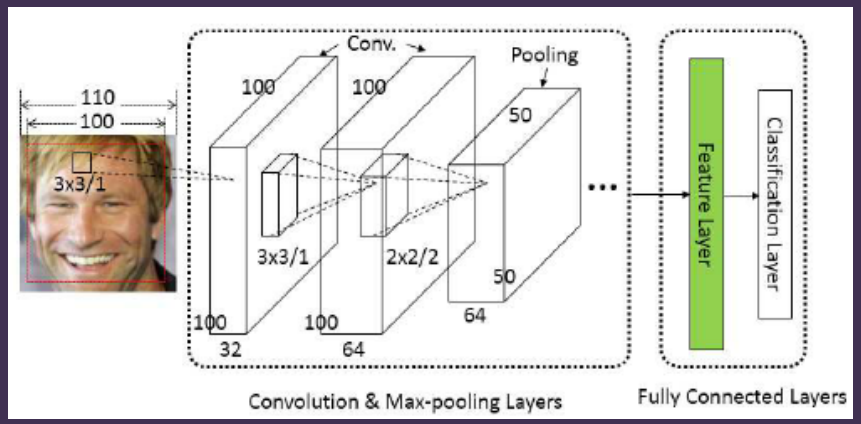

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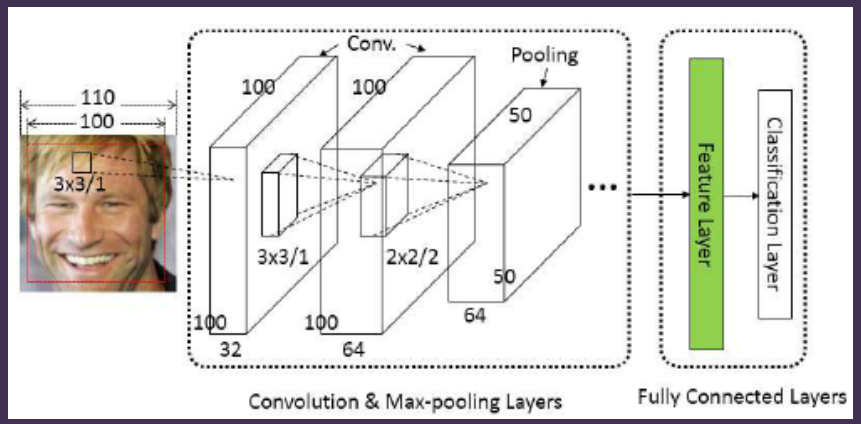

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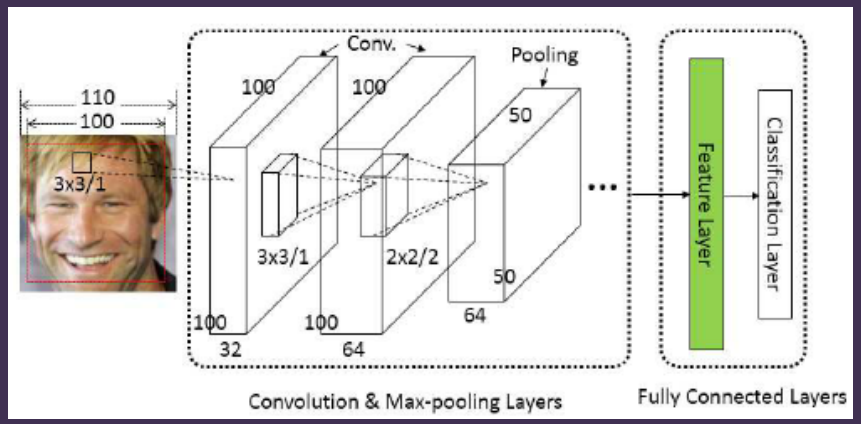

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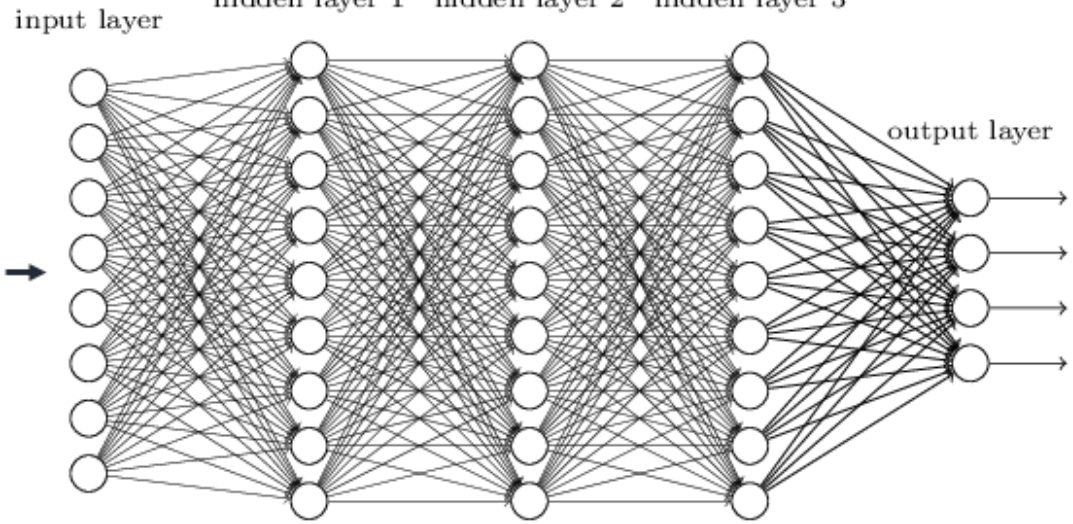
- There are also fully connected layers

Deep neural networks learn hierarchical feature representations



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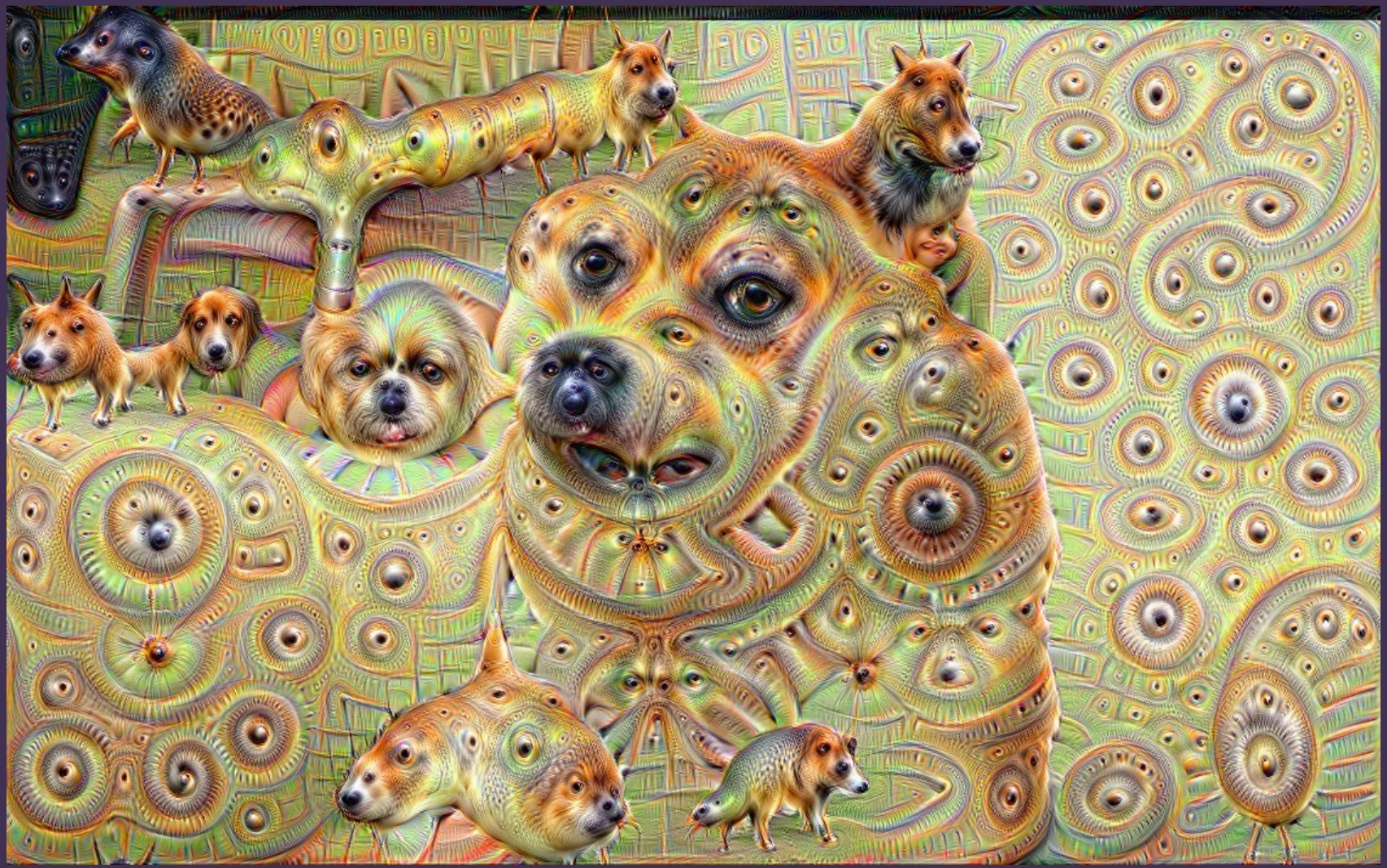

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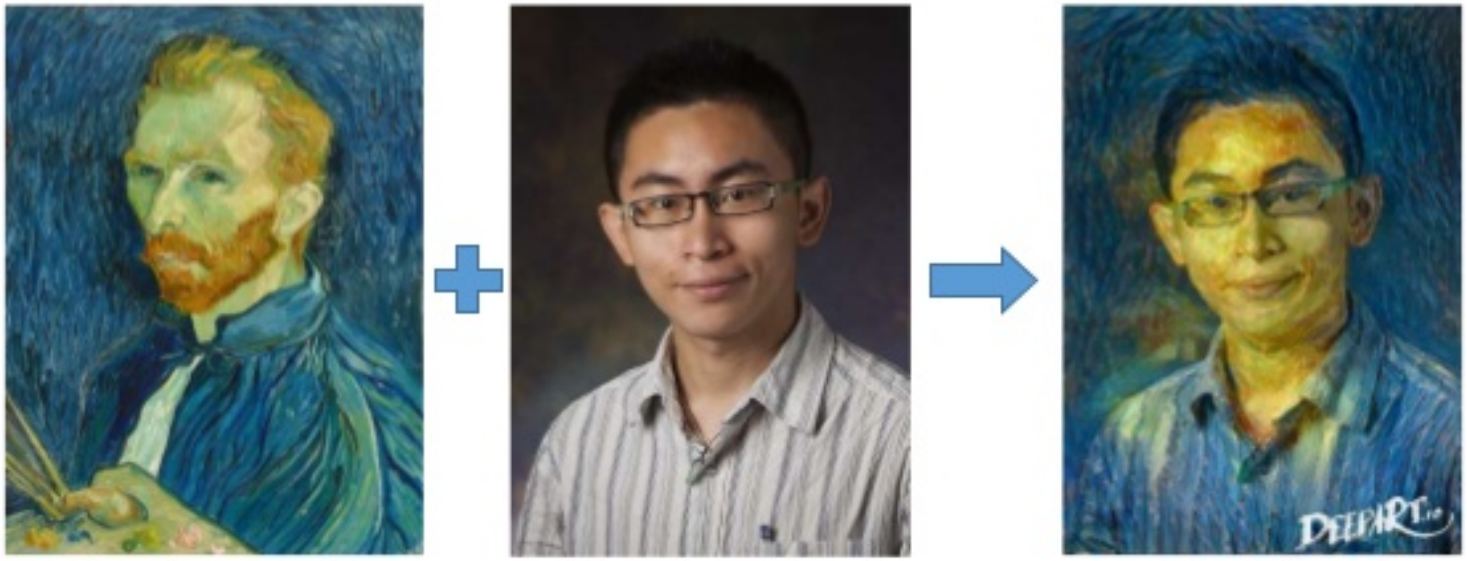

Source image (**Style**) Target image (**Content**) Output (deepart)

A Neural Algorithm of Artistic Style [Gatys et al. 2015]

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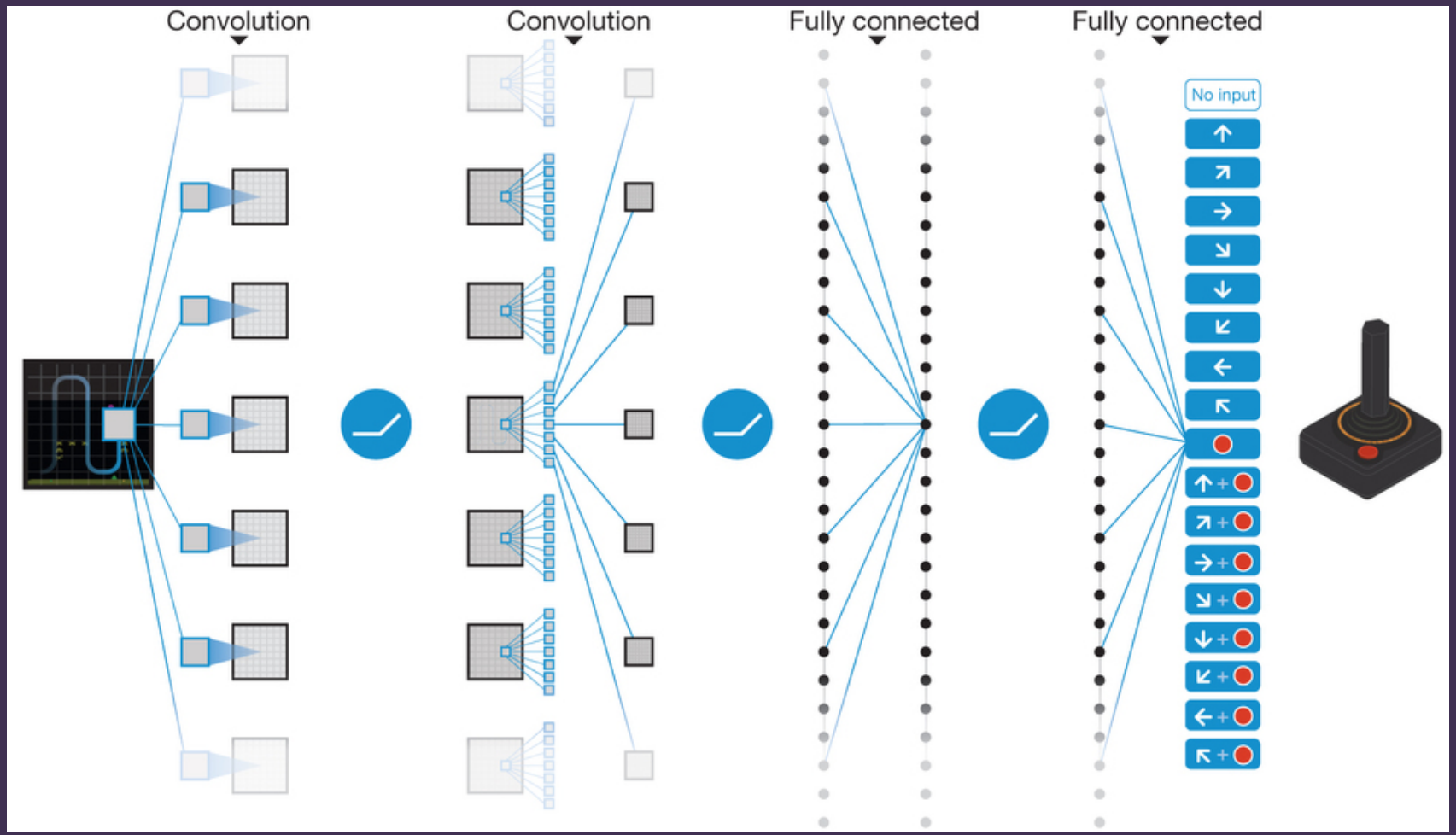
- `http://research.nvidia.com/publication/2017-10_Progressive-Growing-of`

Learning to play Atari games (Mnih et al, 2015)



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- Defeated Lee Sedol, world Go champion

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- Stockfish is based on decades of research by expert chess players and AI programmers — AlphaZero started from no chess-specific knowledge whatsoever (other than the rules of the game)

Deep learning for PCG

https://www.youtube.com/watch?v=3wcpLwvBTYo