Convolutional Neural Networks (CNNs)

How CNNs are changing the world

Patrick Prunty

March 2020

Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin
Ollscoil Átha Cliath | The University of Dublin

Content

- What are Artificial Neural Networks (ANNs)?
- How do Convolutional Neural Networks work?
- Why use Convolutional Neural Networks?
- Applications of Convolutional Neural Networks
- Parallelization

$$C(S,t) = SN(d_1) - Ke^{-r(T-t)}N(d_2) \tag{1}$$

$$d_1 = \frac{\ln(\frac{S}{K}) + (r + \frac{\sigma^2}{2})(T-t)}{\sigma\sqrt{T-t}}$$

$$d_2 = d_1 - \sigma\sqrt{T-t}$$

What are Convolutional Neural Networks (CNNs?

Why do we need to care about machine learning?

Convolutional Neural Networks (CNNs)

Convolutional Neural Networks are simply Neural Networks that use convolution in place of general multiplication in one of their layers.

Motivation

Is your data safe?

- Facebook fined $5bn this year after a year-long investigation into the Facebook-Cambridge Analytica data breach
- Google fined €2.42m in 2017, €4.34m in 2018, and €1.49m in 2019 for misconduct relating to advertisement violation
- "The world's most valuable resource is no longer oil, but data" - Brittany Kaiser, Cambridge-Analytica whistleblower, speaking after discussing the company's involvement in both Brexit's Leave.EU and Trump's presidential election campaign

How does Blockchain work?

How does Blockchain work?

SHA256 and Digital Signature functions

- SHA256("**Message**") = 2f77668a9dfbf8d5848b9eeb4a7145ca...
- Sign("**Message**", Secret Key) = Signature
- Verify("**Message**", Signature, Public Key) = True/False

The End