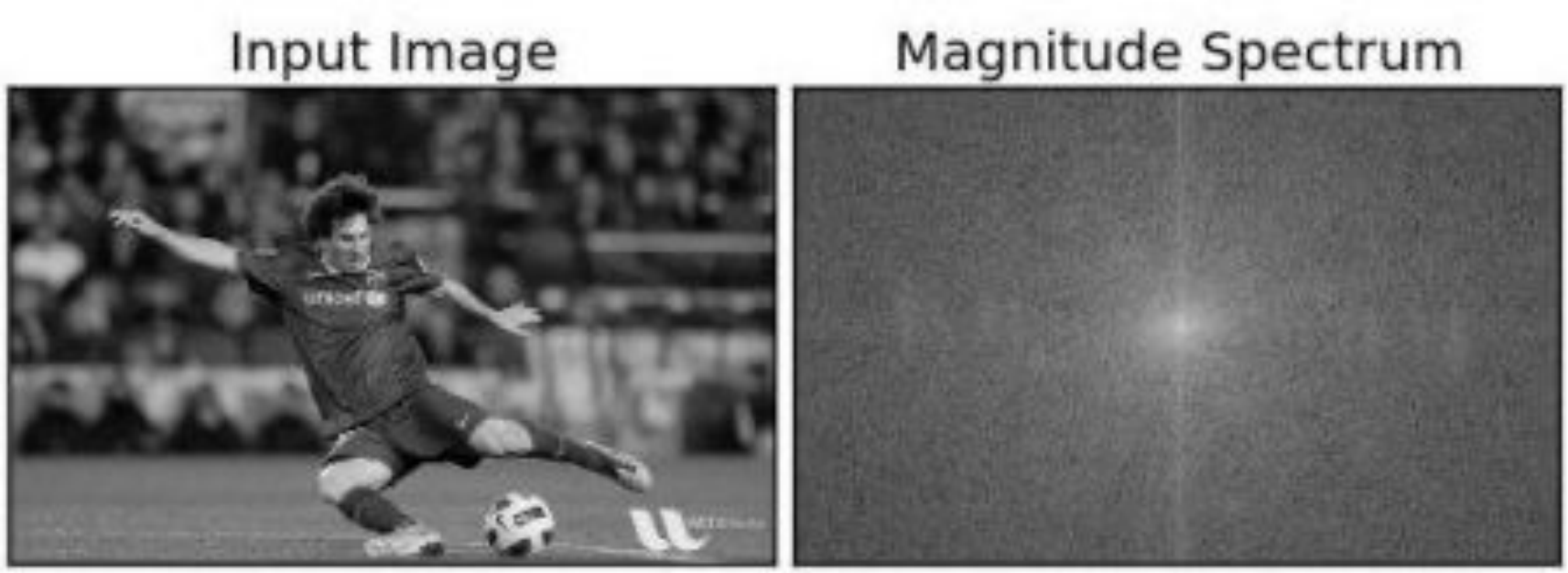
WSTĘP DO GŁĘBOKIEGO UCZENIA

21.11.2023 Computer Vision Seminar 23/24

Transformata Fouriera

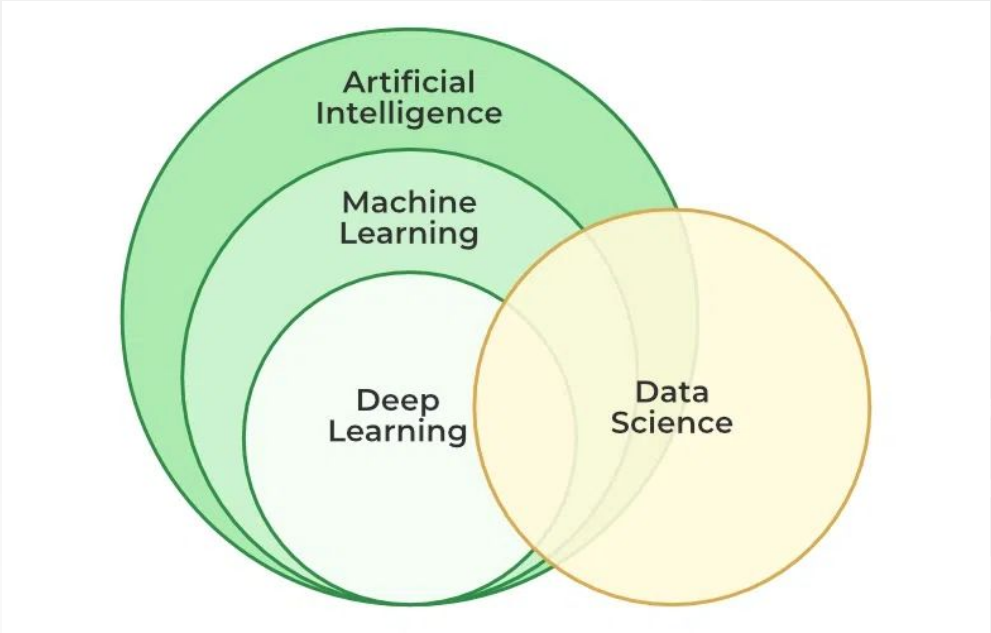


Agenda

1. Czym jest głębokie uczenie?

Szeliski rozdział 5: Deep Neural Networks

Podział AI


Artificial Intelligence
Machine Learning
Deep Learning
Data Science

ML


$y = \beta X + \varepsilon$
Statistics
2009
$y = \beta X + \varepsilon$
MACHINE LEARNING
2019
#10yearchallenge

Historia ML


Important ML milestones
1960S
Decision trees
1980
Backpropagation
1998
CNN
2010S
Deep Learning models
1957
Perceptron
1969
Multilayer perceptron
1990S
SVM
2001
Random Forest
2017
Transformer models

Klasyfikacja zdjęć

```
def classifier(image):
    //Do some stuff
    return class_label;
```

$f($  $) =$ “Cat”

$f($  $) =$ “Dog”

$f($  $) =$ “Toaster”

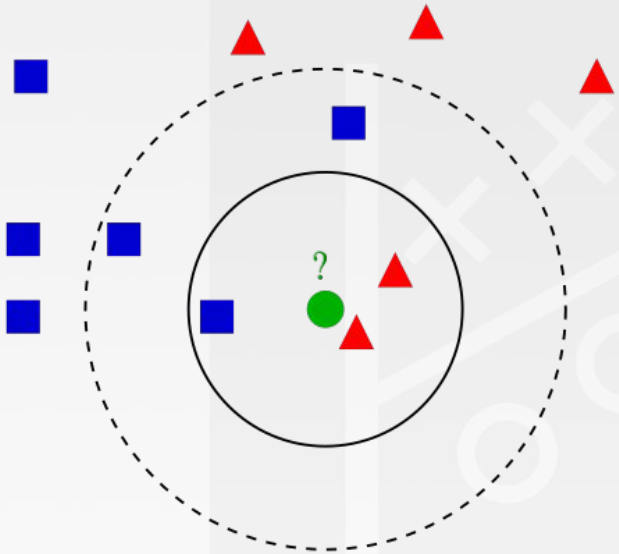
What we see

What the computer sees

Zdjęcie jako wektor w wielu wymiarach

Algorytm K najbliższych sąsiadów

- Podejście data-driven
- Szybki trening
- Wolna inferencja



https://cs231n.github.io/classification/

Materiały

- OpenCV Fourier Transform

https://docs.opencv.org/4.x/de/dbc/tutorial_py_fourier_transform.html

- Image frequency spectrum analysis, FT playground

https://www.djmannion.net/img_freq_web/
https://monman53.github.io/2dfft/

- Tensorflow's Neural Network Playgroud

http://playground.tensorflow.org

- KNN demo

http://vision.stanford.edu/teaching/cs231n-demos/knn/

- Intuitively Understanding Convolutions for Deep Learning

https://towardsdatascience.com/intuitively-understanding-convolutions-for-deep-learning-1f6f42faee1