



# Deep learning and Inverse Problems

## Introduction to Hands-on session

Daniel Otero Bager, Peter Maass

Center for Industrial Mathematics (ZeTeM)  
University of Bremen

Marseille  
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# Neural Networks

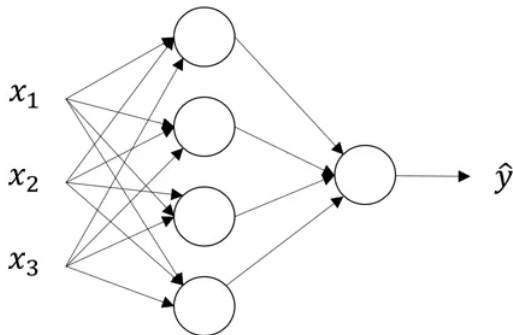


Figure: Shallow Neural Network

# Neural Networks

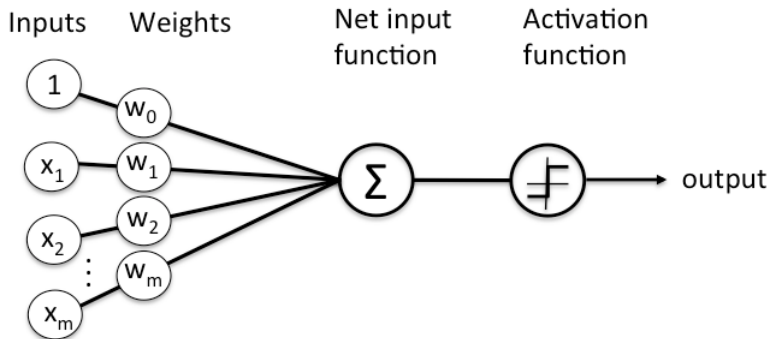


Figure: Structure of a single neuron



# Why Deep learning now?

- Five decades of research in machine learning
- CPUs/GPUs/storage developed for other purposes
- Lots of data from the internet
- Imagenet



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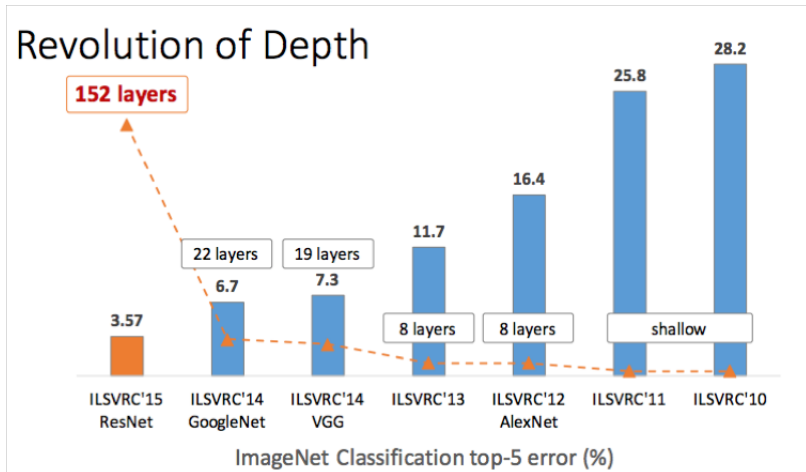


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theano



Microsoft  
CNTK

PYTORCH

 Caffe2

dmlc  
*mxnet*

# Tensors

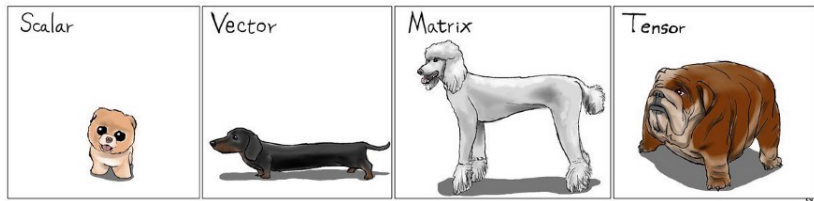
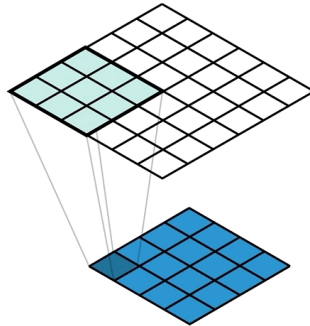


Figure: Tensors <sup>1</sup>

<sup>1</sup>Image source: <https://towardsdatascience.com/understanding-pytorch-with-an-example-a-step-by-step-tutorial>

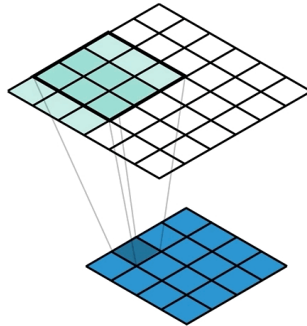


# Convolutions



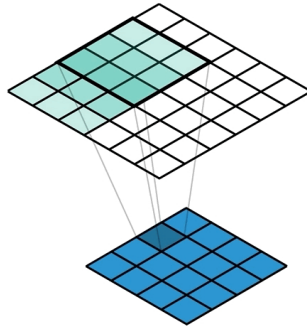


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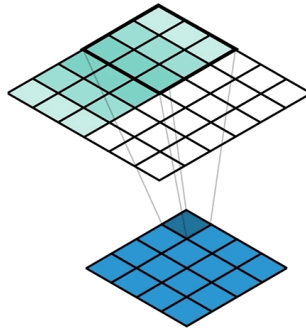


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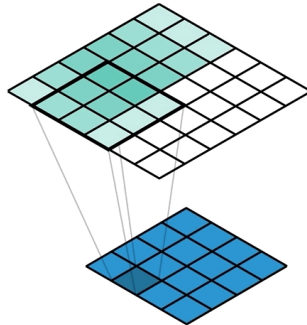


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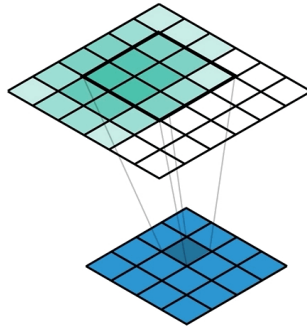
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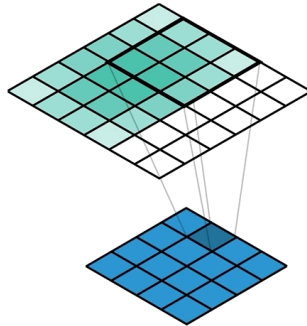


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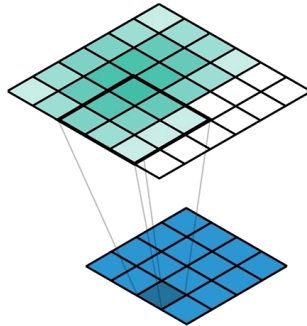


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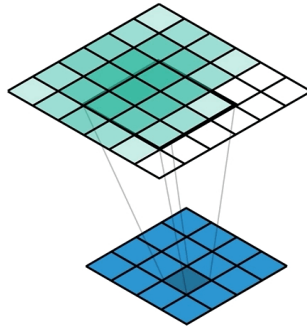


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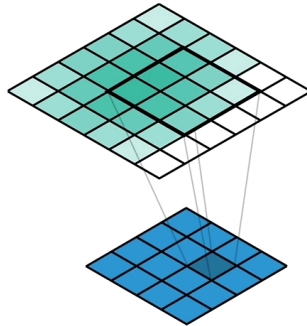


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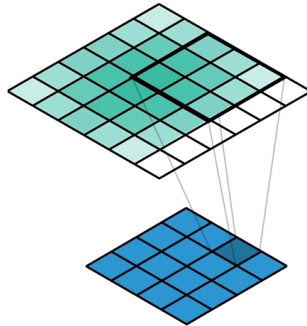


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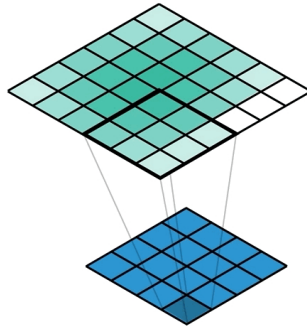


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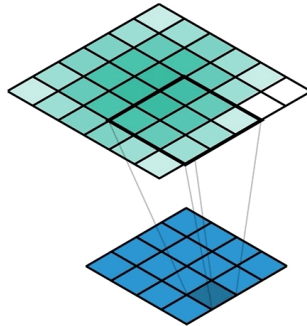


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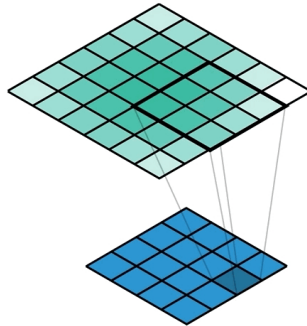
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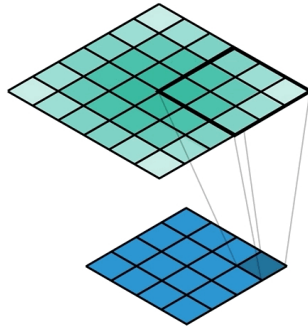


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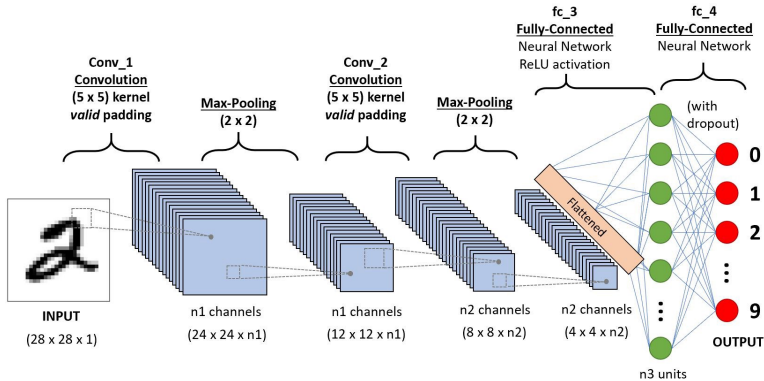




# Convolutions



# Convolutional Neural Network










# PyTorch Intro

# Google Colab


Examples   Recent   Google Drive   **GitHub**   Upload

Enter a GitHub URL or search by organization or user  Include private repos

oterobaguer   

Repository:  oterobaguer/marseille-course   Branch:  master

Path

 00-simple-notebook.ipynb 