

# Unit 8 - Week 7 - Tools and Resources and Interdisciplinary Inspiration

<b>Course outline</b>
How does an NPTEL online course work?
Week 1-Introduction to the Machine Learning course
Week 2-Characterization of Learning Problems
Week 3-Forms of Representation
Week 4-Inductive Learning based on Symbolic Representations and Weak Theories
Week 5-Learning enabled by Prior Theories
Week 6-Machine Learning based Artificial Neural Networks
<b>Week 7 - Tools and Resources and Interdisciplinary Inspiration</b>
<input type="radio"/> Tools and Resources <input checked="" type="radio"/> Interdisciplinary Inspiration <input type="radio"/> Quiz : Assignment 7 <input type="radio"/> Lecture Notes
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## Assignment 7

The due date for submitting this assignment has passed. **Due on 2020-04-15, 23:59 IST.**  
 As per our records you have not submitted this assignment.

- Four languages or groups of languages are consistently considered the currently most popular programming languages for Machine Learning. Which of the five alternatives below does not belong to these groups? **1 point**
  - C/C++/C#
  - Go/Ruby/Julia/Perl
  - Python
  - R
  - Java/JavaScript

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Go/Ruby/Julia/Perl
- Which of the programming languages below can be characterized as a 'Multi Paradigm Language' in the sense that it by its original design have core primitives that support both imperative, functional and object oriented programming? **1 point**
  - Pascal
  - C
  - C++
  - LISP
  - R
  - Haskell
  - Prolog
  - Python
  - Java
  - JavaScript
  - Visual Basic

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Python
- One popular tool in a currently typical machine learning toolbox, provides collaborative environments, where you can freely combine human-readable narratives with computer readable codes, equations and visualizations. Pick this tool from the list below: **1 point**
  - Caffe
  - Pytorch
  - Theano
  - Jupyter Notebooks
  - Tensorflow
  - Microsoft Cognitive Toolkit

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Jupyter Notebooks
- Many Machine Learning tools are specialized for support of ANN, in particular Deep Learning. Examples are given below. One of the given Tools have an ambition for support for Machine Learning techniques in general. Which one? **1 point**
  - Keras
  - Pytorch
  - Scikit-learn
  - Tensorflow
  - Caffe

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Scikit-learn
- Tensor Flow is a free and open-source software library for dataflow and differentiable programming across a range of tasks including machine learning. Which Company developed Tensor Flow? **1 point**
  - Amazon
  - Alibaba
  - IBM
  - Google
  - Microsoft
  - Huawei
  - Facebook

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Google
- Which of the following systems for technical computations can be freely accessed (being non proprietary)? **1 point**
  - Mathematica
  - Macsyma
  - MATLAB
  - Maple
  - Maxima

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Maxima
- Large software companies normally provide platforms specifically for Cloud Computing. Examples are Apple iCloud, IBM Cloud, Google Cloud etc. A few more examples are given below. However one of these platforms has other objectives. Which? **1 point**
  - Amazon Webservices
  - Microsoft Azure
  - SAP Leonardo
  - Adobe Creative Cloud
  - Kamatera

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: SAP Leonardo
- Two common types of software licenses for ML tools are Apache Licenses and BSD Licenses. Which of the following Machine Learning software tools is NOT provided through a BSD License: **1 point**
  - Caffe
  - Pytorch
  - Hadoop MapReduce
  - Theano
  - Anaconda
  - Jupyter

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Hadoop MapReduce
- Machine Learning algorithms in particular of the ANN kind typically demands more computational power than what normally can be provided by conventional CPUs. Heterogeneous computing refers to the incorporation of a number of specialized processors in a single system, or even a single chip, each optimized for a specific type of task. Heterogeneous optimized hardware comes in three forms: **1 point**
  - Graphics Processing Units (GPUs) are specialized hardware for the manipulation of images and calculation of local image properties.
  - Field-programmable gate arrays (FPGAs) are reconfigurable devices make it easier to evolve hardware, frameworks and software alongside each other.
  - Application-specific integrated circuits (ASICs) may achieve an increase of a factor of up to 10 in efficiency due to the more specific design.
  - Combinations of CPUs, GPUs, FPGAs, ASICs and other components.

Select the right combination of heterogeneous optimized hardware categories and state of the art concrete implementations:

<input type="radio"/> GPU	<input type="radio"/> Intel Cyclone	<input type="radio"/> FPGA	<input type="radio"/> Nvidia T4	<input type="radio"/> ASIC	<input type="radio"/> Intel Nervana
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<input type="radio"/> GPU	<input type="radio"/> Nvidia T4	<input type="radio"/> FPGA	<input type="radio"/> Intel Nervana	<input type="radio"/> ASIC	<input type="radio"/> Intel Cyclone

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: GPU, Nvidia T4, FPGA, Intel Cyclone, ASIC, Intel Nervana
- General-purpose computing on a GPU (Graphics Processing Unit), better known as GPU programming, is the use of a GPU together with a CPU (Central Processing Unit) to accelerate computation in applications traditionally handled only by the CPU. Programming languages for this purpose are referred to as GPU languages. Which of the following languages/libraries is NOT a so called GPU language/library? **1 point**
  - CUDA
  - OpenCL
  - Haskell
  - Harlan
  - CuDNN

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Haskell
- Digital (Virtual) Assistants or synonymously Chatbots have become more useful, largely due to improved Speech Technology based on Machine Learning. Which company has in 2014 launched a digital assistant named Cortana? **1 point**
  - Apple
  - Amazon
  - Microsoft
  - Google
  - Samsung

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Microsoft
- Machine Learning is an essential technology for Advanced Driver Assist Systems (ADAS) Or Auto-pilots for Self-driving vehicles. Which company has launched an Auto-pilot named SuperCruise? **1 point**
  - Tesla
  - General Motors
  - Daimler Benz
  - Google Waymo
  - Uber
  - NVIDIA

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: General Motors
- The dominating hardware providers are launching Systems on a Chip (SoCs) that can provide the basic functionalities for Advanced Driver Assist Systems (ADAS) on various levels (2-5). The core of the functionality of the SoCs is the image recognition enabled by Machine Learning (Deep Learning) Which is the correct coupling between the hardware providers and ADAS SoCs? **1 point**

<input type="radio"/> Qualcomm - Drive Xavier/Pegasus	<input type="radio"/> Nvidia - Snapdragon Ride	<input type="radio"/> Intel - Mobileye
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<input type="radio"/> Qualcomm - Mobileye	<input type="radio"/> Nvidia - Drive Xavier/Pegasus	<input type="radio"/> Intel - Snapdragon Ride

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Qualcomm - Snapdragon Ride, Nvidia - Drive Xavier/Pegasus, Intel - Mobileye
- Which Dataset Repository is primarily a gate-way to 'primary source' repositories for Data-sets **1 point**
  - Imagenet
  - Kaggle repository
  - Data.Gov
  - Google trends
  - Amazon reviews

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Kaggle repository
- Learning of Language and language engineering in CS and AI is strongly inspired by the structuralist view on Linguistics. Who was the front figure for this view? **1 point**
  - Bloomfield
  - Chomsky
  - Hockett
  - Lakoff

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Chomsky
- New findings regarding how humans categorize the objects in the world give support to specific Machine Learning methods. Choose a pair of two approaches: **1 point**
  - Nearest Neighbour algorithm + ID3 algorithm
  - K-means algorithm + Conceptual clustering
  - Nearest Neighbour algorithm + K-means algorithm
  - Nearest Neighbour algorithm + Conceptual clustering
  - K-means algorithm + ID3 algorithm
  - Conceptual clustering + ID3 algorithm

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Nearest Neighbour algorithm + K-means algorithm
- The Energy function in Hopfield Networks is inspired by a model of ferromagnetism in Statistical Mechanics. The model is named after a person. Which? **1 point**
  - Lenz
  - Hopfield
  - Onsager
  - Ising

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Ising
- Control theory/Cybernetics is an import field of inspiration for Re-inforcement learning? Select the most important aspect of reinforcement learning that has been inherited via this source of inspiration. **1 point**
  - Internal credit and blame to system components
  - Probabilistically based Policies
  - Feedback loop based on Error measurement/Reward

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Feedback loop based on Error measurement/Reward
- A movement within Psychology is consistent with the motivations behind the sub-symbolic approach of artificial neural networks. Which movement? **1 point**
  - Cognitivism
  - Reductionism
  - Behaviourism
  - Structuralism
  - Functionalism

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Reductionism
- A movement within Psychology is consistent with an abstract model of Cognition in terms of Symbols, Concepts and logically related inferences. Which movement? **1 point**
  - Cognitivism
  - Reductionism
  - Behaviourism
  - Structuralism
  - Functionalism

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Cognitivism
- The Classical view of categories can be partially characterized by one of the following statements **1 point**
  - Categories are arbitrary. Typically the ways we choose to categorize objects are culturally and linguistically based
  - Categories are built around central members or prototypes defined by sharing more attributes with other members than with nonmembers
  - Members are graded based on typicality

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Categories are arbitrary. Typically the ways we choose to categorize objects are culturally and linguistically based
- The Modern or Natural view of categories can be partially characterized by one of the following statements: **1 point**
  - The member schema is no internal structure and all members are regarded as equal and first class citizens.
  - The levels in a hierarchy (lattice) of categories have the same status.
  - Categories are in many case motivated by properties of our sensory system and the world surrounding us.

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Categories are in many case motivated by properties of our sensory system and the world surrounding us.
- The human brain is assumed to have in the order of: **1 point**
  - 1 Billion neurons and 10 0 times as many connections.
  - 10 Billion neurons and 10 00 times as many connections.
  - 100 Billion neurons and 10 000 times as many connections.
  - 1000 Billion neurons and 100 000 times as many connections.

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: 100 Billion neurons and 10 000 times as many connections.
- The property of the brain that several different parts of the brain potentially have the possibility to contribute to specific behaviours is referred to by a specific term. Which? **1 point**
  - Resilience
  - Locality
  - Plasticity
  - Equipotentiality
  - Mass action
  - Specificity
  - Holism

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Equipotentiality
- One psychologist argued for a holistic standpoint through a famous analogy between the Brain and a Hologram (a hologram being an image recording, where the recorded image can be reconstructed from every tiny fragment of the recording). Which psychologist? **1 point**
  - Roger Sperry
  - Eric Kandel
  - Karl Lashley
  - Alexander Luria
  - Karl Pribram
  - Fernando Nottebohm

No, the answer is incorrect.  
 Score: 0  
 Accepted Answers: Karl Pribram