Óbuda University John von Neumann Faculty of Informatics			Institute for Cyber-Physical Systems	
Name and code: Intelligent Systems / NIXIR0EBNE **Credits:** *Computer Science and Engineering BSc programme* *2022/2023 year II. semester*				
Subject lecturers: Dr. László Kutor, Dr. Gábor Csiszár				
Prerequisites (with code):				
Weekly hours:	Lecture: 1	Seminar.:	Lab. hours: 2	Consultation:
Way of assessment:	Test and assignments			
Course description:				
Goal: Introduction to Artificial Intelligence				
Course description: **The aim of the course is**: to introduce the basic concepts of the most recent paradigms in artificial intelligence.				

Lecture schedule	
Education week	*Topic*
1.	What is intelligence, how to measure it. Main trends in AI
2.	Basic components and concepts in artificial neural networks
3.	Supervised and self-organising neural networks
4.	Problem solving using search, Genetic algorithms
5.	Knowledge based systems, Fuzzy logic
6.	Biological and technical sensors
7.	Main paradigms in AI, Embedded and Ambient Assistive Intelligent systems
8.	
9.	
10.	
11.	
12.	
13.	
14.	

Midterm requirements

Mid-term mark, 50% theory, 50% practice

Lecture dates: March. 8, 22, 29, April. 5, 12, 19,

Test: April 26, (in class)

Retake of the missed test: May3, (in class)

Tests: The test will be in Moodle.

Final grade calculation methods		
Points	Grade	
89-100%	excellent	(5)
76-88%	good	(4)
63-75%	fair	(3)
51-62%	sufficient	(2)
0-50%	insufficient	(1)

Type of exam
Theory: test in Moodle **Lab:**

Type of replacement

References
Mandatory:

Recommended:

Lecture 1

Kara **7:01**
https://www.youtube.com/watch?v=1EvqiGm0wz8

Most realistic humanoid robot
https://youtu.be/BpnnD_0IlbE

Boston Dynamics
https://youtu.be/uhND7Mvp3f4
https://youtu.be/rEg6oeazTNY

Blinkist.com
Robot dog
https://www.cnn.com/videos/business/2018/10/16/robot-dog-spot-dancing.cnn-business

Food delivery robot
https://news.berkeley.edu/2018/05/31/those-four-wheeled-robots-on-campus-explained/

Google's driverless car | Sebastian Thrun 4:14
https://youtu.be/bp9KBrH8H04

Ray Kurzweil: The Coming Singularity 7:10
https://www.youtube.com/watch?v=1uIzS1uCOcE

2029 : Singularity Year - Neil deGrasse Tyson & Ray Kurzweil 20:42
https://www.youtube.com/watch?v=EyFYFjESkWU

What is intelligence: 13:46
https://www.youtube.com/watch?v=OBGDMtg9xUs

Theories of intelligence: Kahn Academy **7:10**
https://www.youtube.com/watch?v=oaJ01Ex7DLw

The Turing Test 2:58
https://www.youtube.com/watch?v=1uDa7jkIztw

Passing the Turing test 4:45
https://www.youtube.com/watch?v=oHL1JpPTle0

Strong AI vs. Weak AI 2:43
https://www.youtube.com/watch?v=5nwUJnlvjCc

Artificial Intelligence: it will kill us | Jay Tuck | TEDxHamburgSalon **17:32**
https://www.youtube.com/watch?v=BrNs0M77Pd4

The singularity is coming -- are you ready | Dr. Jonathan White | TEDxEdmonton **14:39**
https://www.youtube.com/watch?v=TRbErYIUvS4

The Real Reason to be Afraid of Artificial Intelligence | Peter Haas | TEDxDirigo 12:37
https://www.youtube.com/watch?v=TRzBk_KuIaM

Self driving trucks
https://www.youtube.com/watch?v=TWHgajaEMM8

Self-driving delivery trucks are on the road
https://www.youtube.com/watch?v=JwBXM_f23m4

Lidar
https://www.wired.com/2016/10/ubers-self-driving-truck-makes-first-delivery-50000-beers/

Robotic Welding
https://www.thomasnet.com/insights/robotic-welding-sourcing-picks-up-as-industry-4-0-momentum-continues/?utm_content=featuredvideo

Readings

The Three Breakthroughs That Have Finally Unleashed AI on the World
https://www.wired.com/2014/10/future-of-artificial-intelligence/

Chatbots
http://www.businessinsider.com/best-ai-chatbots-online-robot-chat-2017-10

Wechsler test: **13:23**
https://www.youtube.com/watch?v=bqX4KgWx9Ww

Lecture 2

Tesla quantum Supercomputer
https://www.youtube.com/watch?v=qCw3S6VopoA

Andrei Karpathy's dissertation
https://cs.stanford.edu/people/karpathy/main.pdf

Recent courses of Neural networks

"Convolutional Neural Networks"

Kürt Akadémia
https://kurtakademia.hu/kepzeseink/ai-technologia/?gclid=Cj0KCQiAu62QBhC7ARIsALXijXSn0lAenGz3m4yVy-gTjCgE8T26ZU6DIurtddLRflzgshIGVti_GRQaAk_kEALw_wcB

Udemy
https://www.udemy.com/course/convolutional-neural-networks-for-image-classification/?utm_source=adwords&utm_medium=udemyads&utm_campaign=LongTail_la.EN_cc.ROWMTA-A&utm_content=deal4584&utm_term=_._ag_80979681514_._ad_533999950009_._kw__._de_c_._dm__._pl__._ti_dsa-1007766171312_._li_9105375_._pd__._&matchtype=&gclid=Cj0KCQiAu62QBhC7A

RIsALXijXS93PkcT0c4lv4-ZiU6d6nuABoxY29VvpQCMpkwhyDUNCeiBokPqawaAknwEALw_wcB

Coursera
https://www.coursera.org/learn/ai-for-everyone?utm_source=gg&utm_medium=sem&utm_campaign=08-AIforEveryone-ROW&utm_content=B2C&campaignid=9727679885&adgroupid=99187762066&device=c&keyword=data%20and%20machine%20learning&matchtype=b&network=g&devicemodel=&adpostion=&creativeid=428167449287&hide_mobile_promo&gclid=Cj0KCQiAu62QBhC7ARIsALXijXR6HvoQg5iy5s63GLjSdTMI3zE0y1kmlZY0YVUSHfTtAIxb3zlAnTMaAlnqEALw_wcB

Lecture 3

Learning representations by back-propagating errors
http://www.cs.utoronto.ca/~hinton/absps/naturebp.pdf

Neural Networks
https://towardsdatascience.com/convolutional-neural-networks-357b9b2d75bd

Simple explanation of convolutional neural network | Deep Learning Tutorial 23
https://www.youtube.com/watch?v=zfiSAzpy9NM

Lecture 6

Trends in AI
https://youtu.be/Y5UmPijUkaU

Future Computers Will Be Radically Different
Analog computers
https://youtu.be/GVsUOuSjvcg

Boston Dynamics' amazing robots Atlas and Handle
https://youtu.be/uhND7Mvp3f4
https://youtu.be/fn3KWM1kuAw

What They Don't Want You to See. Boston Dynamics and AI.
https://youtu.be/SiZZkrEyw5Q