

Course Introduction

What (and how) are we going to learn?

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sli.do

#DeepLearning

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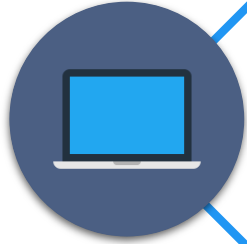
Course Objectives

**Achieving state-of-the art results
by learning like a human**

Course Objectives

- Learn how neural networks are used in the real world
- Get insights on structuring a deep learning algorithm
 - Architecture
 - Hyperparameters
 - Troubleshooting and debugging
- Learn how to manage a deep learning project
 - E.g. utilizing big data, error analysis, project roadmap
- Learn various concepts related to deep learning tasks
 - E.g. images, text, spatial data, audio, playing games, generation
- Explore and use popular architectures
- Do at least one **complete project**

Prerequisites



Programming Basics

- Familiarity with **Python** is required
- Software development experience is a plus



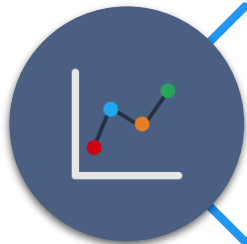
Maths and Machine Learning

- Some algebra, calculus and statistics
- Knowing the foundations of **machine learning** is required



Intermediate English

- Understand what is written on the slides



Scientific Mindset

- Know how to work with data
- Be open to (and not afraid of) challenges



Course Format Details

Curriculum, schedule, trainer,
lecture format, exam

Curriculum

- Introduction to deep learning. Basic models
- Training and improving neural networks
- Image-related neural networks
- Natural language processing
- Neural network architectures
- Generative models
- Reinforcement learning
- Course / module summary: Q & A

Course Schedule

- Lessons
 - 9 lectures x ~ 3 hours each on-site
- Homework: 0+ hours
 - You're on your own!
 - Try reading papers
 - Even scientific articles
 - Try out different possibilities
 - Architectures, models, model compositions, loss functions, etc.
- Extracurricular activities: 0+ hours
- Practical exam
 - Preparation at home – 4+ hours
 - On-site defense: 10 minutes

Final Exam

- Practical project
 - Work on your own
 - No teams allowed
 - Present your results (documentation, code, models, Web services, etc.) in a **limited** amount of time
- Work on a given assignment
 - Perform research
 - Scientific papers, community forums, etc.
 - Analyze the data
 - Choose or create an architecture
 - Perform several iterations of modelling
 - Document all your findings
 - Communicate the results
 - Optionally... do whatever you like :D

Grading Scheme

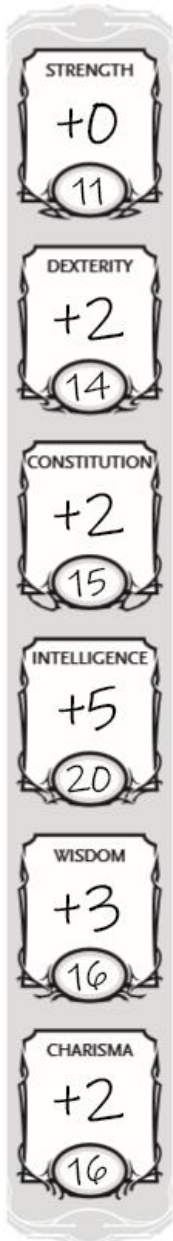
- Final exam
 - Develop at your own pace
 - Upload deadline: 24 January 2020, 12:00:00 GMT+2
 - On-site defense: 26 January 2020, 09:00:00 GMT+2
 - Retake: 16 February 2020, 09:00:00 GMT+2
 - Online defense
 - Shoot me an email :)
- Forum / Facebook group activity
 - Bonus up to 20%

Grading and Course Certificate

- All students will be graded on a scale from 2.00 to 6.00
 - The same way the standard grading in Bulgaria works
- Everyone who scores ≥ 5.00 (total) on the course will get a **certificate** from SoftUni
 - Starting point for a **new career** or **continuing education** in your current field
 - **Career assistance**
 - The SoftUni career center will help you find work
 - Official and recognizable
 - Employers value certificates
 - Proof of hard work :)
 - Shareable and verifiable



Who Am I?



- Programmer
 - .NET / full-stack Web developer
- Machine learning engineer
 - Multiple projects, mainly image processing
- Trainer
 - Various programming courses
 - Scientific (and popular) lectures
- Scientist / Enthusiast
 - BSc (July 2016), MSc (February 2018) in Astrophysics
 - Currently pursuing a PhD



Learning Resources

**Learn more
and share your knowledge**

SoftUni Course Pages

- Official Web page of this course
 - <https://softuni.bg/trainings/2318/deep-learning-november-2019>
- Forum category
 - Open courses > Deep Learning
 - Ask and answer questions
 - I will try to answer your questions as well
 - Post what you've learned
 - Links to resources, code snippets, ideas, tips and tricks
 - Share your problems (homework or not) and help solve them
 - **Create and maintain a community**
 - A **critical part** of software development and science
- Facebook group
 - <https://www.facebook.com/groups/DeepLearningNovember2019/>

Online Resources

■ Books

- ["How not to be wrong"](#) – Jordan Ellenberg
- [Deep Learning](#) – Ian Goodfellow
- ... and anything else you can find

■ Websites

- Communities: [Kaggle](#), [Quora](#), [Stack Exchange](#)
- Online courses: [Coursera](#), [edX](#), [MIT OCW](#), [Stanford](#), etc.
- "Big players": [Microsoft](#), [Google](#), [Facebook](#), [Amazon](#), [IBM](#), [Apple](#), etc.

■ YouTube

- [FunFunFunction](#), [Daniel Shiffman](#), [AsapSCIENCE](#), [Veritasium](#), [Vsauce](#), [TedEd](#), [CrashCourse](#), [Mind Your Decisions](#), [Infinite Series](#), [Numberphile](#), [Computerphile](#), [Vi Hart](#), [3Blue1Brown](#), [blackpenredpen](#), [Mathologer](#), and many more

The image features a white background with two decorative blue bars. The top bar is a solid blue strip. The bottom bar is a gradient blue strip that transitions from a lighter blue on the left to a darker blue on the right. The word "Questions?" is centered in a blue, sans-serif font.

Questions?