

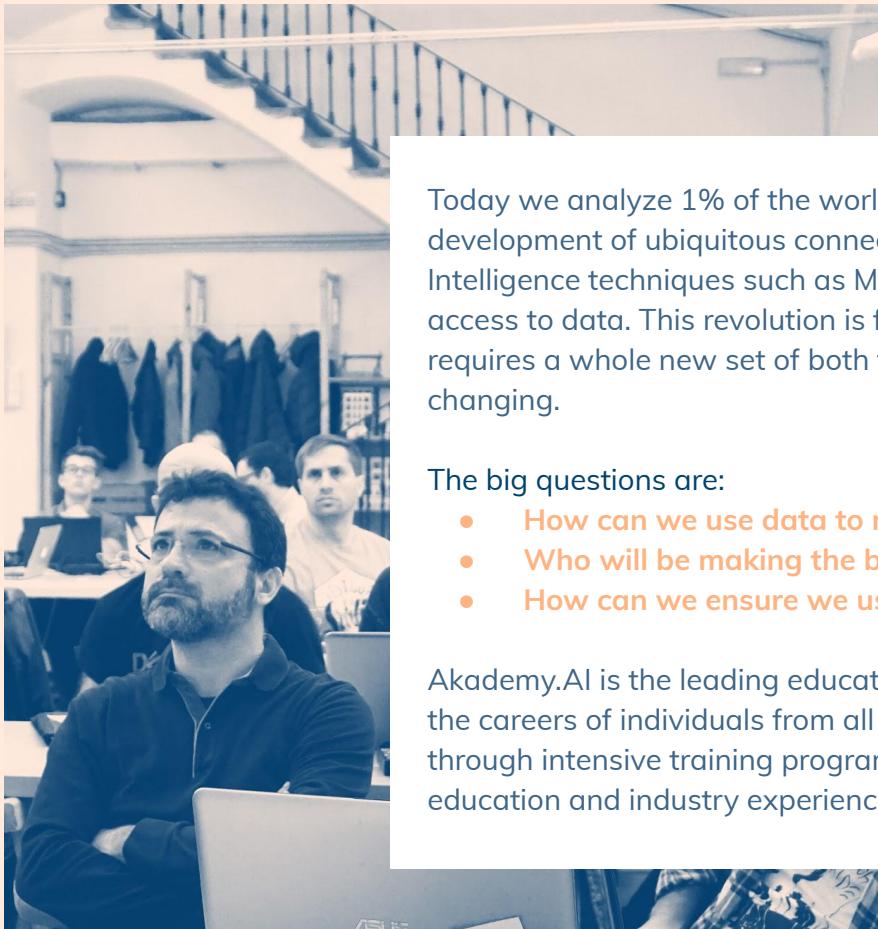


Intensive AI Course

Welcome!



EPITECH AI Engineer



About akademy.AI

Today we analyze 1% of the world's data. However the growth of computing power, the development of ubiquitous connectivity, as well the phenomenal progress of Artificial Intelligence techniques such as Machine Learning and Deep learning is opening unprecedented access to data. This revolution is fundamentally transforming society and the way we work and requires a whole new set of both technical and soft skills to understand how the world is changing.

The big questions are:

- **How can we use data to make better decisions in business and technology?**
- **Who will be making the biggest impact in science, industry and technology?**
- **How can we ensure we use data and technology in a responsible and ethical way?**

Akademy.AI is the leading education hub for Artificial Intelligence. We accelerate and transform the careers of individuals from all background by helping them master Artificial Intelligence through intensive training programs, taught by vetted professionals with years of both education and industry experience.

*Knowledge in Python required. At least four hours coding daily during the bootcamp.

Introduction to AI

- What is AI, what does it matter, why does everyone need to master it
- What students will learn during this course - objective, structure, expectations
- Project brainstorming - Engaging the students, and get them to define their own learning objective
- First set of exercises + mini challenge project (Python fundamentals + web scraping project)

Data Science libraries

Students jump right into a Python- based curriculum where we explore and learn best practices in probabilistic and statistical analysis, including frequentist and Bayesian methods.

Numpy - Session 2

Why use Numpy
Accessing, Deleting, inserting...
Slicing ndarrays
Boolean and Arithmetic operation

Pandas - Session 3

Creating pandas Series & Acces/Del
Pandas dataframe
Accessing elements in pandas df
Nan & lead data to DF

Linear Regression and sklearn - Session 4

Introduction to Anaconda and Jupyter notebook
Introduction to the sklearn ML framework
Linear Regression
Iris Dataset Project

Statistical and Machine Learning

Dive into statistical / machine learning, work on structured and unstructured data sets. We'll leverage the Python ecosystem of powerful libraries and use some real-world case studies.

Session 5 Introduction to AI and Machine Learning

Main uses and application areas

Overview of the field

Project ideation
Combined with AI

Session 6 Supervised Learning

Decision Trees

K-nearest Neighbors

Random Forests

Boosting

Time Series

Session 7 Applied Machine Learning

PCA

Ensemble models

Mini-Project

Mini-Project Titanic survival prediction

Pandas

Numpy

One-hot encoding

Optional: Ensemble models

Optional: Improving Iris Dataset Project

0 h

3 h

12 h

21 h

48 h

Intro to Deep learning - Session 8 & 9

Foundations of AI, Perceptron, Linear regression using Gradient descent, Backpropagation, Error Criteria, Regularization, Application of NN in Tensorflow / Pytorch

Convolutional Neural networks - Session 10

Convolution and Pooling, Layer depth, Transfer learning project

Dataset exploration and preprocessing - Session 11

Figuring out what makes a dataset good, cleaning the data, ways to obtain the data

Computer vision - Session 12 & 13

OpenCV Framework, Image Segmentation, Image Manipulation, Edge and Contour detection, KeyPoint Detection, Computer Vision Project

Deep Learning

Deep learning is a set of advanced machine learning techniques that powers many of today's most cutting edge applications, including image recognition, machine translation, self-driving cars, speech recognition, and more. It is based on neural networks, which are loosely inspired by the structure of the human brain. In this unit, students will establish a thorough foundation in deep learning.

0 h

3 h

12 h

21 h

39 h

48 h

Session 14 to 16

Work on the applied project will involve the following

- Picking the right challenge
- Selecting the dataset and preprocessing
- Model building
- Accuracy and performance improvements
- Final improvements and implementation
- Optional: End-to-end deployment
- Presentation

Final Project

The final project reflects the technical skill set students have learned throughout the course, and demonstrates their competence and fitness as potential data scientists.

Students work with instructors to brainstorm and refine project ideas and proposals. After a project plan is finalized, the student is responsible for collecting and analyzing data, and presenting the results of their research in a professional final product. Many students build applications to package their insights.

Intro to Python

One of the most fundamental steps of AI is learning the right language for it. Python has been the most used over R and C++ due to its simple syntax and inter-package cooperation & availability.

Python

- Syntax
- Functions
- Conditionals
- Strings
- Lists
- Dictionaries
- Loops
- External Libraries

Numpy

- Why use Numpy
- Accessing, Deleting, inserting...
- Slicing ndarrays
- Boolean and Arithmetic operations
- Numpy mini-project

Pandas

- Why use Pandas
- Creating pandas
- Series & Acces/Del
- Pandas dataframe
- Accessing elements in pandas df
- Nan & lead data to DF
- Panda mini-project

Anaconda and Jupyter Notebooks

- What is Anaconda
- Installing Anaconda
- Managing packages and environments
- Launching a Notebook server
- Best practices

Our teachers

Nicolás Pascual

Python Fundamentals



Statistics & Machine Learning

Full-stack dev at Betterplace

Master in Artificial Intelligence

Avid hackathon participant



Jan Carbonell

Machine & Deep Learning

Master in Artificial Intelligence

Self-taught developer

Founder of Akademy.ai, Saturdays.ai and bcn.ai

We <3 coding with a purpose



Our learning methodology



Learn by doing

70% practical, 30% theory. The AI scientist mindset is forged by combining indispensable theoretical knowledge with the building of open-source projects. All students implement and test end-to-end AI projects based on real applications, based on their interest or field of expertise.



Pair-Programming

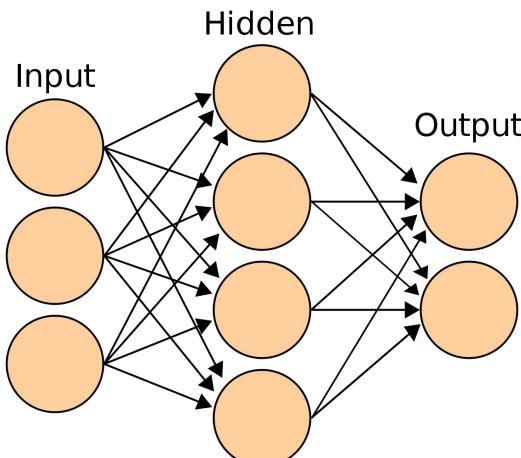
The key to the success of our courses is both our world class instructors and our motivated fellows and their ability to help each other. We match instructors and fellows according to their goals and ensure that they work together to push their projects beyond their comfort zone.



Intensive focus

In a world of distractions, we provide the right environment and incentives so our fellows can focus on learning and coding AI during intense and highly actionable work sessions, with meaningful projects being achieved as outcomes.

My Hidden Layers



CAREER CHOICES

```
31     self._fp = None
32     self.fingerprints = set()
33     self.logdups = True
34     self.debug = debug
35     self.logger = logging.getLogger(__name__)
36     if path:
37         self._fp = open(os.path.abspath(path), 'rb')
38         self._fp.seek(0)
39         self.fingerprints.update(a.rstrip() for a in self._fp)
40
41     @classmethod
42     def from_settings(cls, settings):
43         debug = settings.getbool('REQUEST_FINGERPRINT_DEBUG')
44         return cls(job_dir(settings), debug)
45
46     def request_seen(self, request):
47         fp = self.request_fingerprint(request)
48         if fp in self.fingerprints:
49             return True
50         self.fingerprints.add(fp)
51         self._fp.write(fp + os.linesep)
52
53     def request_fingerprint(self, request):
54         return request_fingerprint(request)
```



LISTENING

I was lucky that some people were willing to help me beyond what it was expected of them

SHORTEST PATH?

Avoid highways and shortcuts.
Make your own way.

MY DREAM

Using technology to have a positive
impact in our society

A black and white photograph of a group of runners in a marathon. In the foreground, two male runners are prominent. The runner on the left is wearing a black Under Armour shirt and shorts, with race number 50493, and is making a peace sign with his right hand. The runner on the right is wearing a dark shirt with a red and black graphic, race number 405281, and has his right arm raised in a wave. They are running on a paved road with a metal guardrail on the left. Other runners are visible in the background under a hazy sky.

ATTITUDE > SKILLS

You set your own limitations
Anything can be learned



WORK IN SILENCE

Ignore the noise, focus on achieving results
Don't compare yourself to others

TEAM > GOING SOLO

Surround yourself with people
that are better than you

BE PERSEVERANT

A photograph of a person rappelling down a steep, rocky cliff face. A yellow safety rope is visible in the lower-left foreground. In the background, another person is visible at the top of the cliff. The sky is overcast.

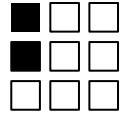
Hard work beats talent
when talent doesn't work hard



/ Intro

Introduction to the AI program, the experts and the working methodology.

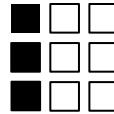
Discussing the framework for the following weeks.



/ Coding w/ Python

- While you may not know Python yet, we assume you are good developers
- Python is essential for AI
- Get proficient in a week:
 - Lists and Dictionaries
 - Loops and Recursion
 - Executing .py programs
 - Object Oriented Programming

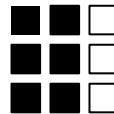




/ Python Module

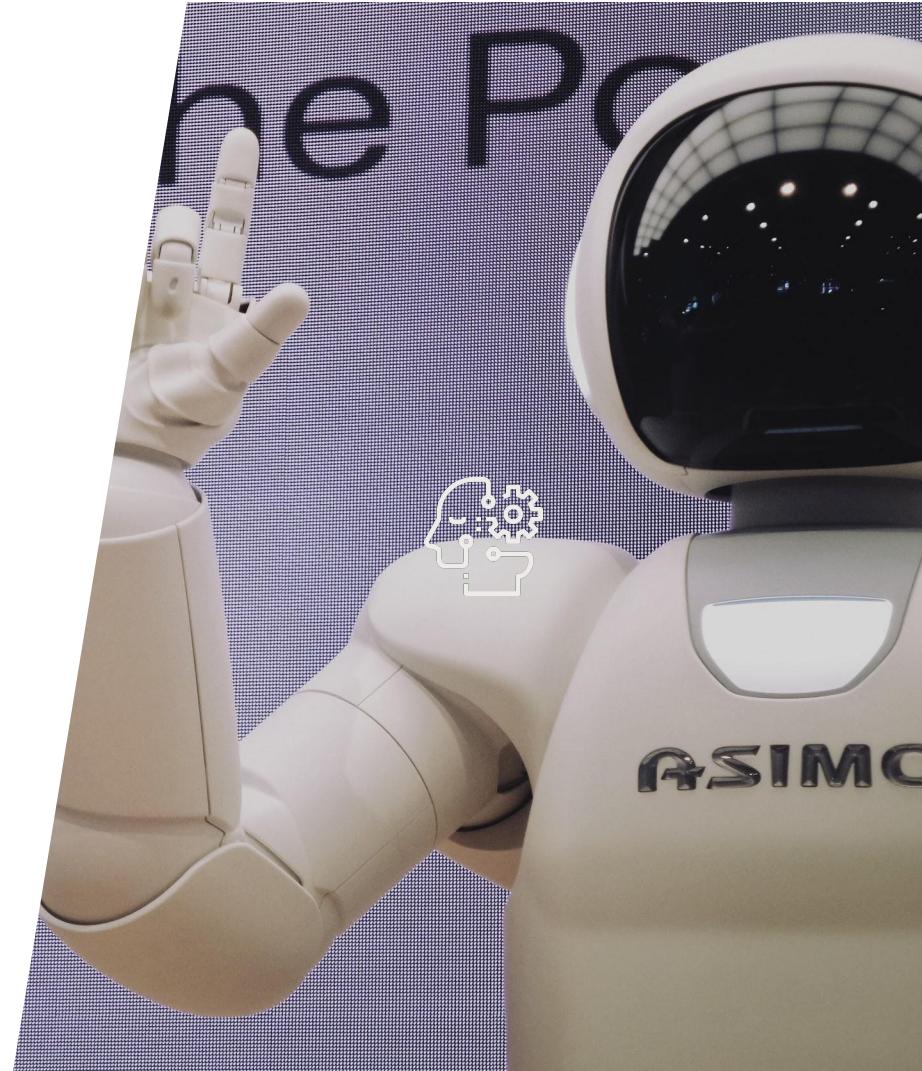
- **Introduction to Python**
 - Syntax and functions
 - Booleans and conditionals
 - Lists, strings and dictionaries
 - For, while loops
 - The <import> power of Python
- **Numpy**
- **Pandas**
- **Matplotlib and visualization**
- **Anaconda and Jupyter Notebooks**
- **Linear Algebra & Statistics**

```
self.file = None
self.fingerprints = set()
self.logdups = True
self.debug = debug
self.logger = logging.getLogger(__name__)
if path:
    self.file = open(os.path.join(path, 'fingerprint.log'), 'w')
    self.file.seek(0)
    self.fingerprints.update(fp for fp in self.read())
@classmethod
def from_settings(cls, settings):
    debug = settings.getbool('debug', False)
    return cls(job_dir(settings), debug=debug)
def request_seen(self, request):
    fp = self.request_fingerprint(request)
    if fp in self.fingerprints:
        return True
    self.fingerprints.add(fp)
    if self.file:
        self.file.write(fp + os.linesep)
def request_fingerprint(self, request):
    return request_seen(self, request)
```



/ Machine Learning

- **Math +1 if needed**
- **Intro to machine learning**
- **Launching our first Neural Network**



RULES DISCUSSION



I will not ask dumb questions.

SK (ALL) QUEST

I will not ask dumb questions.

I will not ask dumb questions

I will not ask dumb questions

I will not ask dumb questions

I will not ask dumb questions.

I will not ask dumb questions

ASK (ALL) QUESTIONS



GIVE FEEDBACK



akademy.AI

LEARN!



But first... what about you?

- What is your name?
- What is your background?
- Why do you want to learn AI?
- What do you like to do on the weekends?
- Interesting fact about you
- What is your ideal job?



Ready?



Day to day

Lesson: We will cover the main theme of the session and the necessary resources. You can follow the course at your own rhythm. We strongly encourage teaming up in groups.



Exercises: You will complete the daily challenges based on what was explained in the lecture and whatever useful resource you can find online. The goal is for you to practice how to do this as your job.



Facilitators: Our role is to help you understand the exercises and to bounce back on potential ideas if you are stuck. We won't do the exercises for you.



Review: We will correct the exercises -which you should have finished during the day-. Most of the times, we'll bring you to the atrium to showcase your solution and work on what everyone else has done.



Preparing between sessions: No need to do extra work as you will have very little time. However, we will work on the basis that previous concepts have been well absorbed. Make sure to study them if you are not fully confident with them.

Slack as a resource

The screenshot shows a Slack interface. On the left is a sidebar with a dark purple background containing a list of channels and other sections like 'Threads' and 'Starred'. The main area has a light blue header with the channel name '#general'. Below the header, there's a message from Miguel at 5:22 PM: 'Summer reading! Recommended list of books/ presentations on tech and ethics: <https://docs.google.com/document/d/1bJepkrifNA75XaFe-WFFP1EVvetrg0KyO5TJBzkAdk/edit?usp=sharing>'. A message from Alessia Mondolo at 11:15 PM follows: 'joined #general along with 10 others.' Below these messages, a post from Jan Carbonell at 4:47 PM says 'welcome' and includes a GIF of a woman waving. The message continues: 'Welcome everyone! We're all really happy to have you onboard for this intense 10 weeks of learning 😊'. Another message from Jan Carbonell at 4:56 PM discusses plans for tomorrow, mentioning Spaces offices and visitor passes.

#general

17 | Années adresses à l'ensemble de l'entreprise et informations relatives au travail

Tuesday, July 2nd

Miguel 5:22 PM cool Stephan

Alessia Mondolo 11:15 PM joined #general along with 10 others.

Yesterday

Jan Carbonell 4:47 PM welcome

Posted using /giphy | GIF by T. Kyle (831 kB) ▾

Welcome everyone! We're all really happy to have you onboard for this intense 10 weeks of learning 😊

Jan Carbonell 4:56 PM About tomorrow:

- 9am at Spaces offices, Floor 27 of Torre Mapfre <https://goo.gl/maps/VG1YAgdAJVkSkbfY7>
- Say you are visiting Spaces so you can get a visitor pass (I'll be downstairs at 8:50 just in case)

Don't expect a daily email from us. **Slack is way more direct**, less intrusive than whatsapp and allows us to keep the conversations into relevant threads.

Link <http://bit.ly/epitech slack>

Help us help you!



@akademyAI



akademy.AI



@Akademy.AI



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One last thing...



The AI Hero Pledge

I will apply AI towards the benefit of humanity at all costs.

I will respect every human's privacy as if it was my own.

I will do everything in my power to acquire knowledge and share it with others.

I will set positive models for others to emulate.

I will consider the impact of my models and disobey unjust requests.

I will train my models again and again until I succeed.

I will consider the impact of historical and new bias in my work.

I will preserve human concerns over technological ones.

I will work to create a new set of conditions that reduce inequalities.

My AI models will be designed to prevent harm at all costs.

I will keep my word.

bit.ly/ai_pledge



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Thank You

