Training program

80h training in Artificial intelligence: Tailored for Epitech students, with 60 hours delivered on location at Epitech and 20 hours delivered remotely via exercises and deliveries.

NumPy, Pandas, and Matplotlib and Linear Algebra (25h): Learning how to use all the key tools for working with data in Python, such as Jupyter Notebooks, NumPy, Pandas, and Matplotlib. We also covered the foundational math that is needed for AI success, such as matrices and vectors.

Machine Learning (20h): We covered classification, regression, clustering, and basic ML concepts to start playing with data and gathering insights.

Neural Networks (20h): The students acquired a solid foundation of how Neural Networks work, and went from the most basic concept into the latest research.

Project MVP (15h): Based on an available dataset selected by the students, we mentored them to implement an AI project with a meaningful application. Our goal was to get students to deliver working MVP's while learning in the process.

So... how did it go?

Participation Metrics

- 22 students participated in the first introductory class;

- 16 students registered to do the course (via our slack channel);

- 11 completed the course till the end;

- All 11 students, organised in 4 project teams, delivered a final project and 3 presented it to the whole school during the final demo session.
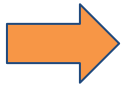
Overall **participation** was **below expectations**. Several students remarked that the class was **taking place too late in the year** and that they could not participate due to **conflicting schedules**.

However, **engagement** from the **participating students** was **strong.**

Students feedback

At the end of each class we requested feedback from all participating students, in order to assess:

- The overall **knowledge** acquired - **Average rating of 8.5/10**
- Their rating of the **teacher** delivering the class - **Average rating of 9.3/10**
- The difficulty and quantity of **exercices** - **Average rating of 7.9/10**

High satisfaction level with solid rating on all teachers

More importantly, the students who completed the course were all **able to implement an MVP**, hence putting the **acquired knowledge into practice**.

Drill down on feedback

Highlight of the key comments raised during the intro course

- This class is great, I love Jan's dynamics and passion for his job. It's a pity that this course is given at the end of the year because I have **validated all my subjects** and I am now focusing on finding a job and my return to Paris.
- Just a **bad timing** the **class began** when my best friend comes at Barcelone, so

  that's why you didn't see me → **Finding a more suitable time next edition.**

- Great class, I already did some machine learning in a previous internship but I **never thinked about it**. That was great to **challenge us** about the power of technology and how it can **impact our future**. I'm ready to start coding.
- It was great, i **want to know more about AI**
- a french proverb: **Les absents ont toujours tort**

Individual Feedback : Focus on practical exercises

- Less video and **more example/practise**, for people being in IT for 4 years some information doesn't need to be explained again and again. Otherwise this introduction was very good for me 7/10
- the courses was really cool and think if next week we gonna practice this would be my favorite module ahaha !
- I prefer **more exercises** about **data manipulation** → **More practice**

- The python basic stuff was taking a bit too long but the rest is perfectly fine
- Go faster on some basic code presentation

- The class are **easy to understand** so spend less time on them but **make more exercice** → **We initially underestimated your programming level**

Individual Feedback: Maths struggles

- Maybe a little more explication for **mathematic parts**
- More **mathematical problems**
- The approach is very good, I struggle a lot but the Nicolas is very precise in his explanations and takes the time. The **level is hard**, especially for math dummy like me, but the course is very interesting. Thank you
- I got a **HighSchool level of math** :l
- We **slack in mathematics area in Epitech** i think, it's been a long time since do math
- **I'm as powerful in math as a dog that is faced to two tricks**.

→ **Some students have very little understanding of the math needed for AI (statistics, linear algebra, calculus...).**

Overall they rated their math skills at 2.2/ 5

Individual Feedback: Machine learning Theory vs practice

- No it's ok, I learn a lot actually
- It was good, more chill, I understand better how to use Dataframe → **Getting into Machine learning was well received, however we moved into practical application slightly too fast:**
- Doing more documentation :)
- I'd like to see some **algorithms in machine learning**
- The only problem on this courses was the fact that some logic was skipped and course/video didn't went far enough to allow us to answer some exercises, if you can **scale exercises a bit down** or maybe **explain a little bit further**, it would be perfect
- the **exercises really differ from the videos**, it's a bit hard to apply what we saw
- More explications

Individual Feedback: Finding the right balance

- Continues it's great

- **Great course today**

- **I love this class :)**

- Nothing to report

- Nothing tout Say everything went great

- Everything ok

- We had a class and then the choice to do the **exercises we wanted**. Good format

→ **By the start of the fourth week, the balance between theory and practice was in place**
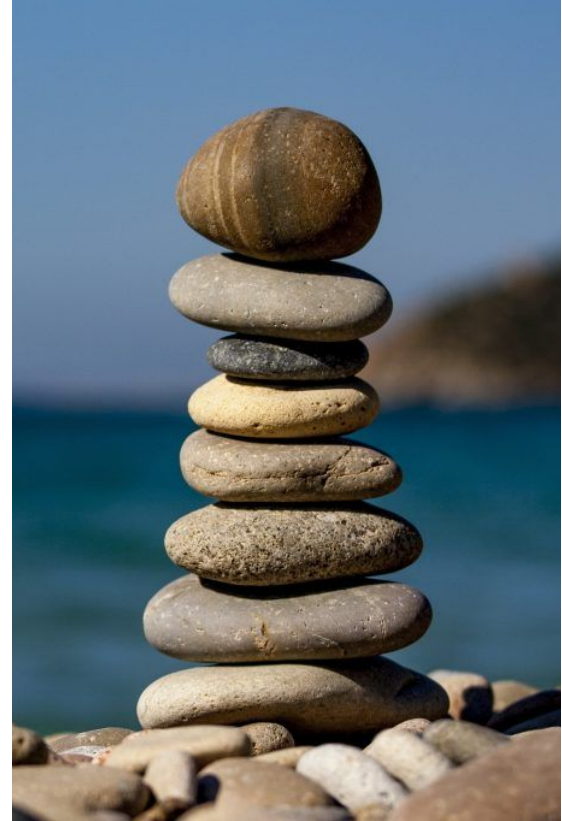
Project Demo's

Project: Sign Language digits recognition

- An implementation of an American Sign Language Dataset on digits.

- The development of an algorithm via a hand-crafted Convolutional Neural Network in order to predict the digits with 90%+ accuracy

- An integration with OpenCV in order to deploy this in real time with a webcam

- An integration with a voice module to spell the digits out loud

- Automatic digit recognition and prediction in real time.

- Deck available here.

Project: Fruit recognition

- An implementation of a 3D Fruit dataset from Kaggle

- Pruning and selection of the relevant fruits and its subclasses

- Implementation of transfer learning with a state-of-the-art
  Convolutional Neural Network in order to achieve high accuracy

- Implementation of OpenCV and deployment in finished program
  that is able to detect, classify and predict fruits in real time.

- Available in Github

Project: Kickstarter success prediction

- An implementation of a kickstarter dataset from Kaggle

- Data visualization and selection for target classes and prediction

- Initial iteration with the raised amount as one of the metrics

- After achieving a high success (94%), removing such metric and figure out if the success can be explained with other metrics that can be targeted at the beginning (such as number of backers).

- Data exploration and prediction of success based on several indicators

Project: **Barcelona population exploration**

- An implementation of a Barcelona open-source dataset

- Data visualization and selection for the most populated neighbourhoods, gender and population distribution by neighbourhood.

- Analysis of the main transportation routes and 3D visualization of the subway and bus locations.

- Code available here

Key learnings and recommendations

- As we had not collaborated before with Epitech, we had to adapt and **find the right balance between theory and practical exercises**, as well as adapting the difficulty and frequency of the exercises. The **regular feedback form** helped a lot to get this right by the mid of the third week.

- Overall, the students are really **good programmers**. We underestimated their capacity to **learn a new language like Python** and adapt it rapidly to AI applications. This part would have to be **improved and condensed** for future iterations.

- We knew beforehand that the **math level was low** for some of the students, but it was hard to assess to which degree. We **began from scratch**. Feedback suggests there was **not quite enough time** for the students to get comfortable. Our suggestion would be to develop some **specific online modules** to cover the required knowledge

Key learnings and recommendations ctd…

- The timing of the class, both in terms of the period of the year (April/May) and the hours of class (mornings from 9 am to 2 pm) prevented a fair number of students from attending or continuing to attend. our recommendations would be to **1) do the module earlier** in the school year, ideally at the beginning, 2) extend it over **a longer period of time, with shorter classes**, and 3) include it in the course credits.

- Finishing the course with a **project and a demo session** proved to be a very strong driver for all students, and **the end results were excellent**. We'd recommend allocating **more time** though for the students to really put their knowledge into practice, with our mentors.

Thank You

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