Artificial Intelligence for Smart Content Creation in Education

Nikola Nikolov, Smartest Learning AG

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www.smartest.io

Today's talk

1. Quick introduction to AI
2. Overview of modern use cases of AI in education
    a. Personalised learning
    b. Universal access
    c. Class analytics
    d. Smart feedback
    e. Smart content creation
3. AI for smart content creation - the case of Smartest Learning
4. Final thoughts / Q&A

What is Artificial Intelligence (AI)?

- The study of **intelligent agents** - systems that perceive their environment and take actions that maximise the chance of achieving a goal.
- **Machine Learning** - the study of computer algorithms that improve automatically through experience.

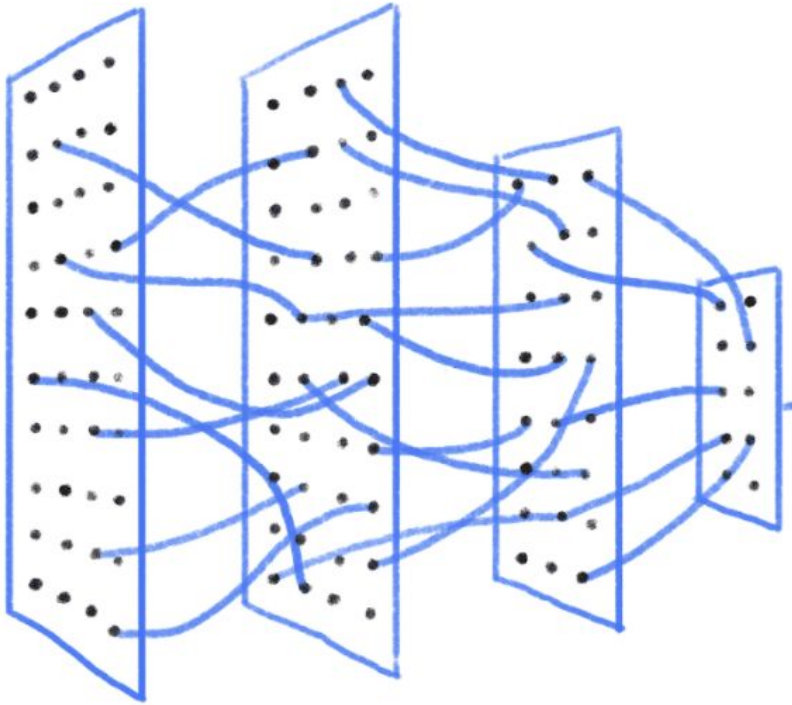
Dataset:

CAT

(LABELED PHOTOS)

DOG

Machine Learning Model:



Prediction:

OUTPUT

cat

✓GOT IT

From: https://github.com/ReiCHU31/Cat-Dog-Classification-Flask-App

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AI is already part of our daily lives

Google

DeepL

Spotify®

TESLA

Beyond day-to-day applications:

- Automated drug discovery
- Manufacturing
- …Many others…

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AI will augment us, not replace us

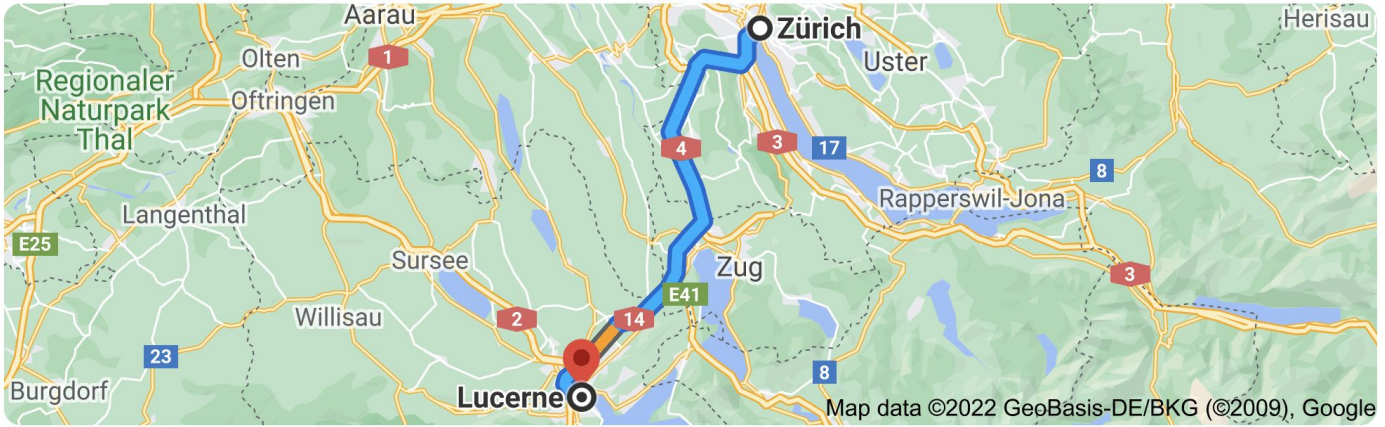
- AI doesn’t work as well for higher-order tasks
  - Complex decision making
  - Creativity
- Biggest impact of AI in the coming decades:
  - Specialized, clearly defined use cases that are repetitive
    - Few edge cases
    - Not safety critical
    - A lot of data is available for training
  - Human in the loop

Artificial Intelligence in Education

- **Teachers**: automate/augment repetitive pedagogical tasks
  - Create multiple versions of the same test
  - Grade tests, and provide feedback to students much more quickly
  - Analyse the performance of individual students, or of a class as a whole
- **Students**: more flexibility and greater autonomy
  - Get a personalised learning trajectory depending on:
    - Prior performance
    - Special needs
  - Improve communication with teachers
  - Receive instant feedback
- Free up time for more complex pedagogical tasks
  - Critical debate in class
  - Collaborative projects

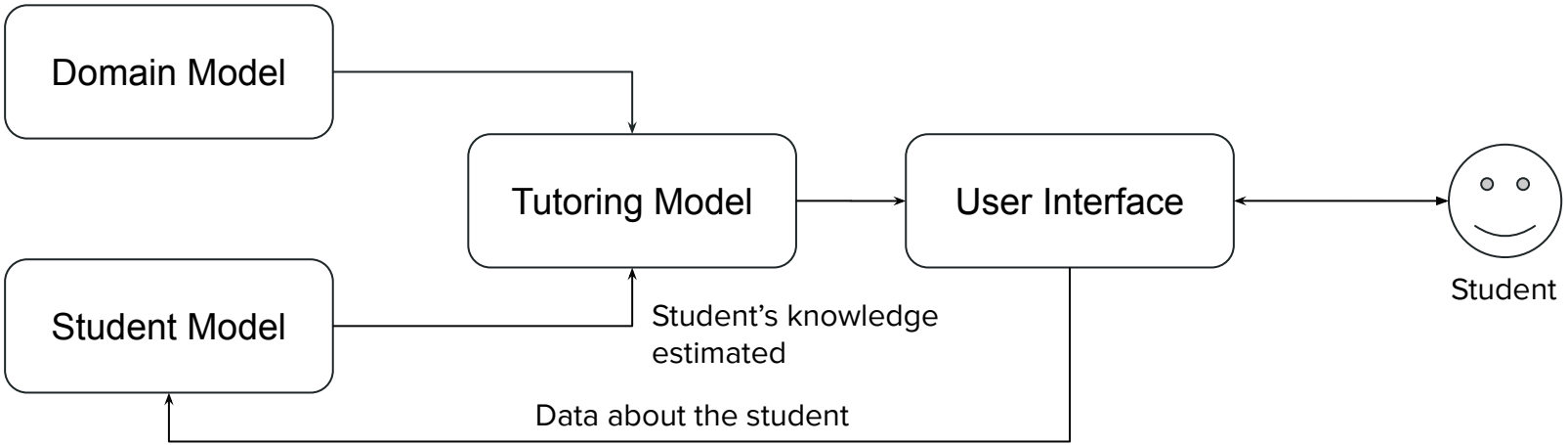
Personalised learning

- Each student is different and has a different learning pace and needs
- 1:1 tutoring is expensive and time consuming
- Create a personalised learning trajectory for each student
  - Automatically collect feedback and adjust



Personalised learning

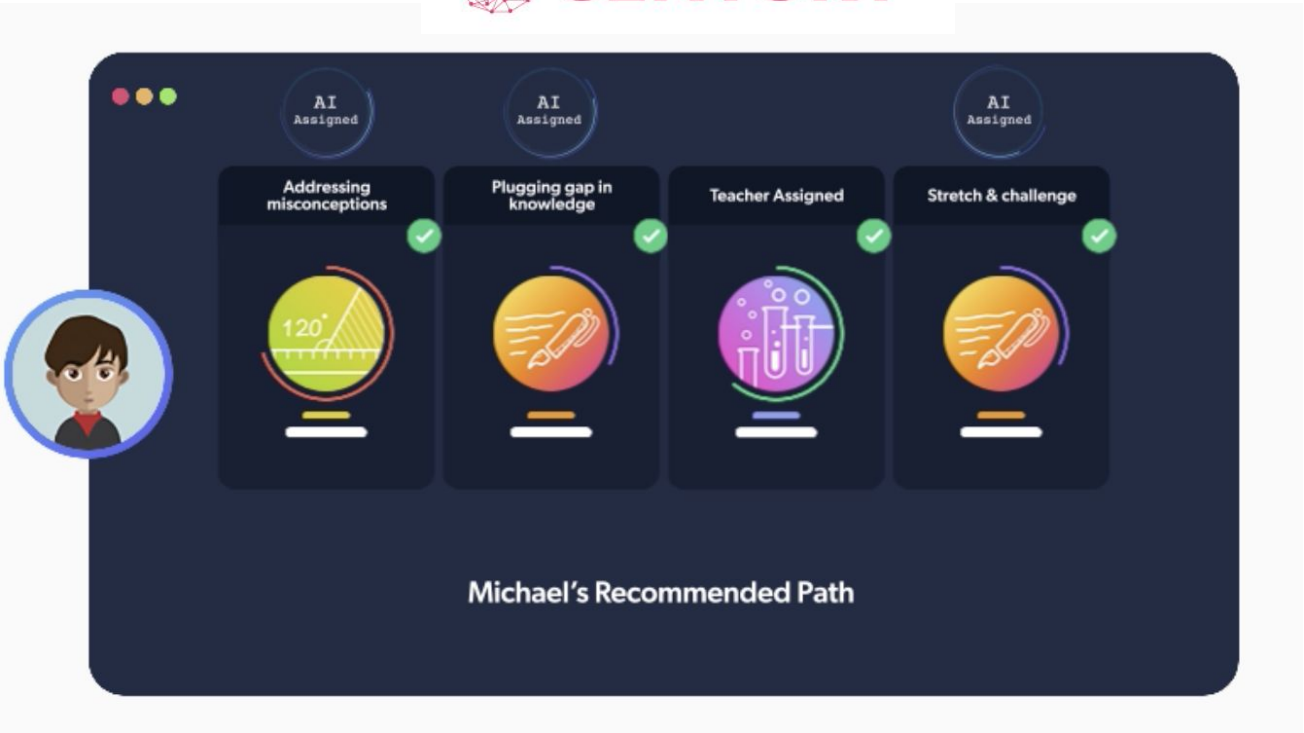
- Build a model of the student, that is updated through feedback
- Recommend the best possible next learning step



Morales-Rodriguez et. al. 2012

Examples

CENTURY



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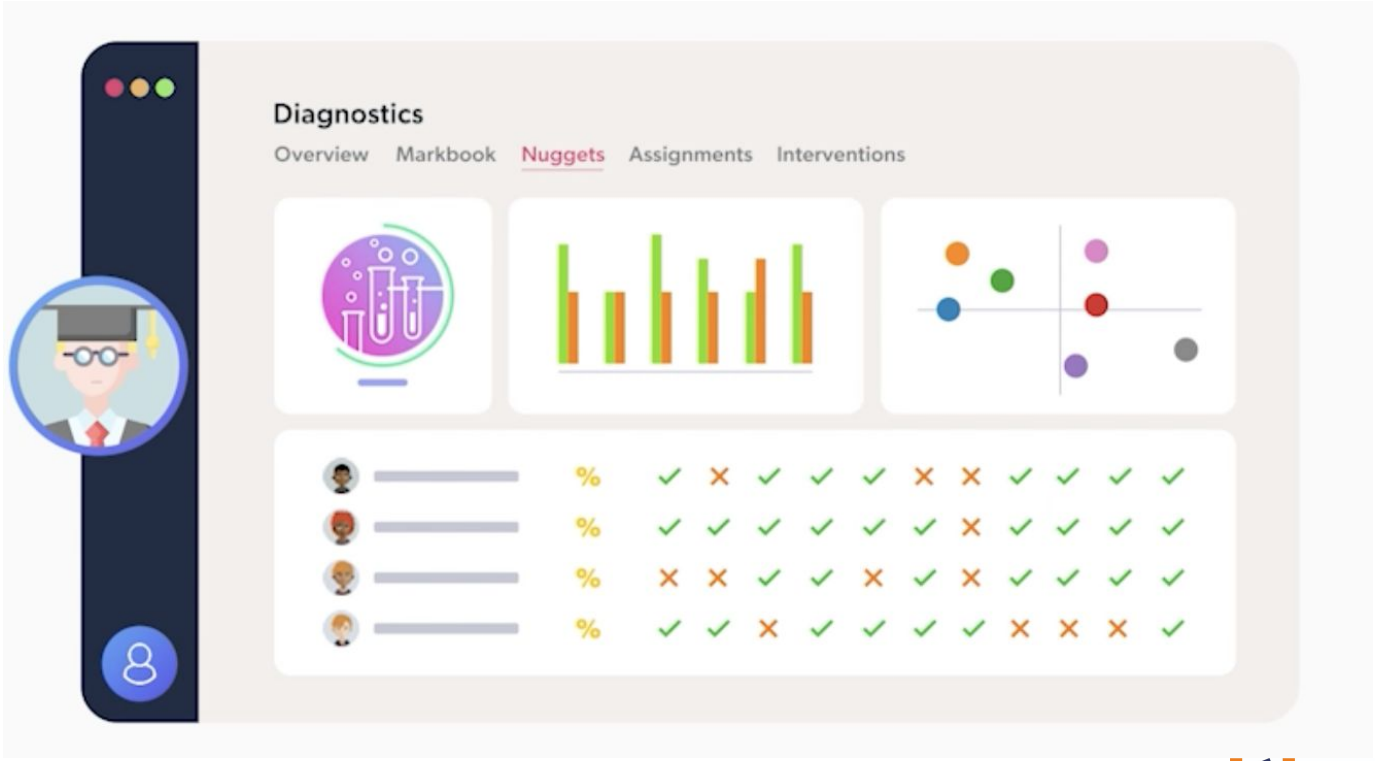
Diagnostics
Overview
Markbook
Nuggets
Assignments
Interventions
%
%
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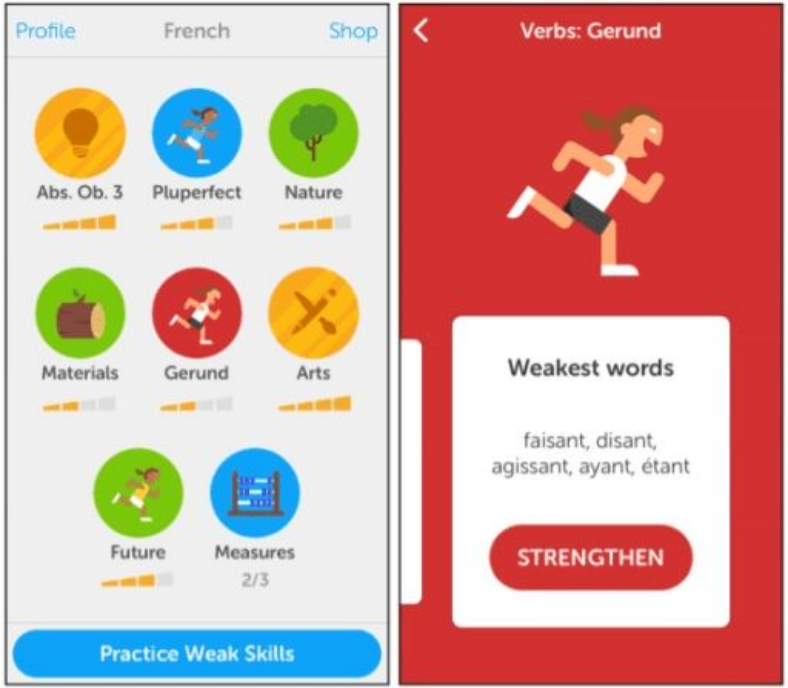

Profile
French
Shop
Abs. Ob. 3
Pluperfect
Nature
Materials
Gerund
Arts
Future
Measures
2/3
Practice Weak Skills
Verbs: Gerund
Weakest words
faisant, disant,
agissant, ayant, étant
STRENGTHEN

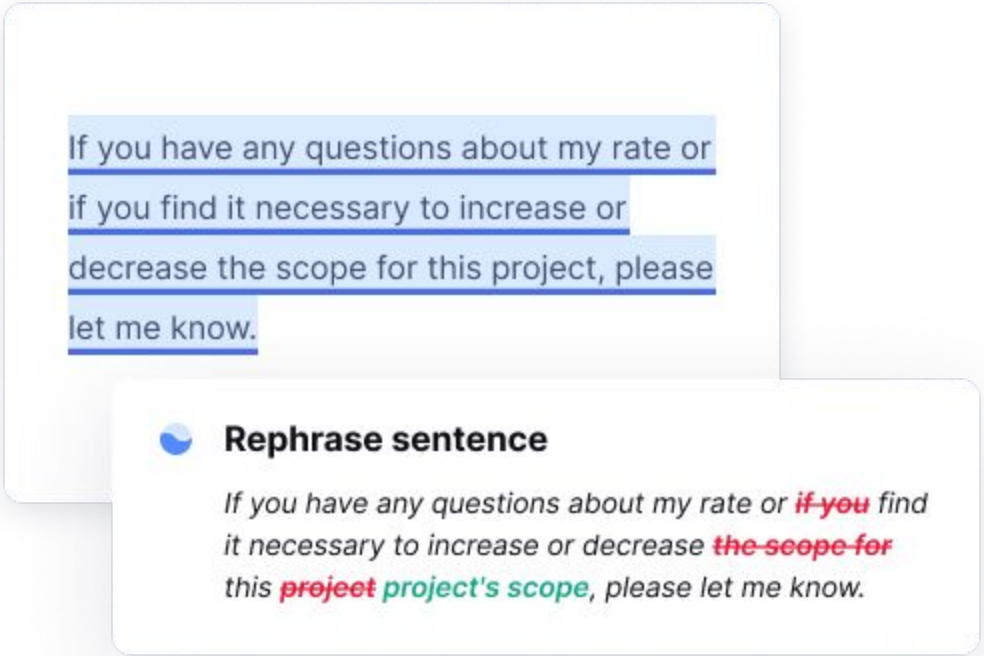
Smart feedback

- Essay analysis/scoring
- Writing analysis and feedback
- Authorship verification

The majestic blue whale, the goliath of the sea, certainly stands alone within the animal kingdom for its adaptations beyond its massive size. At 30 metres (98 ft) in length and 190 tonnes (210 short tons) or more in weight, it is the largest existing animal and the heaviest that has ever existed. Despite their incomparable mass, aggressive hunting in the 1900s by whalers seeking whale oil drove them to the brink of extinction. But there are other reasons for why they are now so endangered.

The blue whale's common name derives from bluish-hue that covers the upper side of it body, while its Latin designation is Balaenoptera musculus. The blue whale belongs to the Mysteceti suborder of cetaceans, also known as baleen whales, which means they have fringed plates of fingernail-like material, called baleen, attached to their upper jaws. Blue whales feed almost exclusively on krill, though they also take small numbers of copepods. An adult blue whale can eat up to 40 million krill in a day.

These gargantuan beasts used to dominate all the oceans of the Earth up until the late nineteenth century, when the technology was developed to effectively hunt and harvest them. In 1864, the Norwegian Svend Foyn equipped a steamboat with harpoons specifically designed for catching large


If you have any questions about my rate or if you find it necessary to increase or decrease the scope for this project, please let me know.
Rephrase sentence
If you have any questions about my rate or ~~if you~~ find it necessary to increase or decrease ~~the scope for~~ this ~~project~~ project's scope, please let me know.

Universal access

Accommodate for all students:

- Accommodate for students that might have visual/hearing/other impairments
- Translate and deliver content in multiple languages to create “global” classrooms
  - Access specialised subjects only available in other schools/online
- Immersive remote learning for students that can’t attend in person

Smart content creation

Generate new learning content: either completely from scratch, or with some user input.

- Exercises
- Training modules
- Other materials

CREATE INTERACTIVE EXERCISES IN SECONDS

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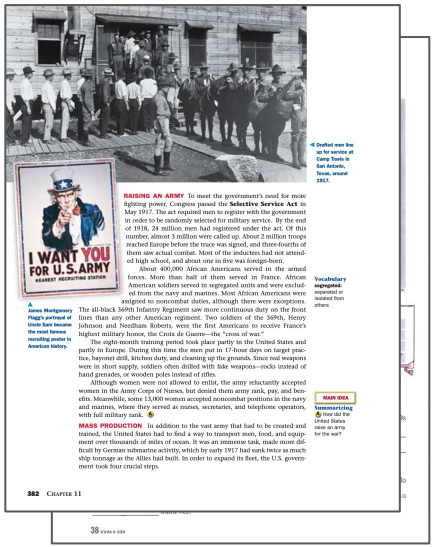
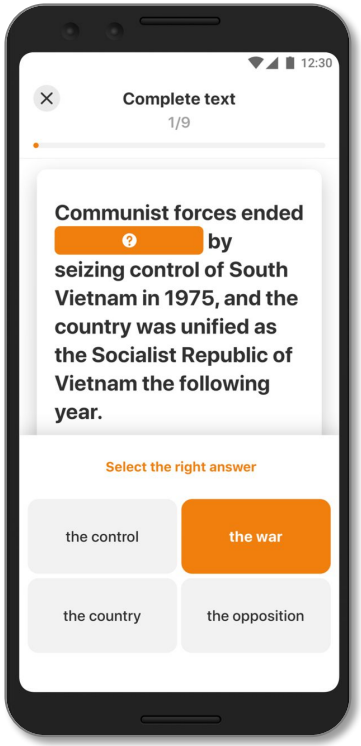


Extract & Analyse

Computer Vision

Generate Tests

Natural Language Processing



BEST OF SWISS APPS 2020 EDUCATION SILVER

BEST OF SWISS APPS 2020 INNOVATION SILVER

BEST OF SWISS APPS 2020 ENTERPRISE BRONZE

Microsoft for Startups

NVIDIA

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Innosuisse – Schweizerische Agentur für Innovationsförderung

SWISS EdTech COLLIDER

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Steve

Cofounder & CEO

15yrs, PhD ETH, MBA, MSc

Mehdi

Cofounder & CCO

20yrs, MBA, MA

Alina

Marketing

BA

Eni

Business Dev.

MA

Karol

Front-End

Nikola

NLP

7yrs, PhD ETH, MSc

Robert

Front-End

Tom

Mobile

20yrs, MSc

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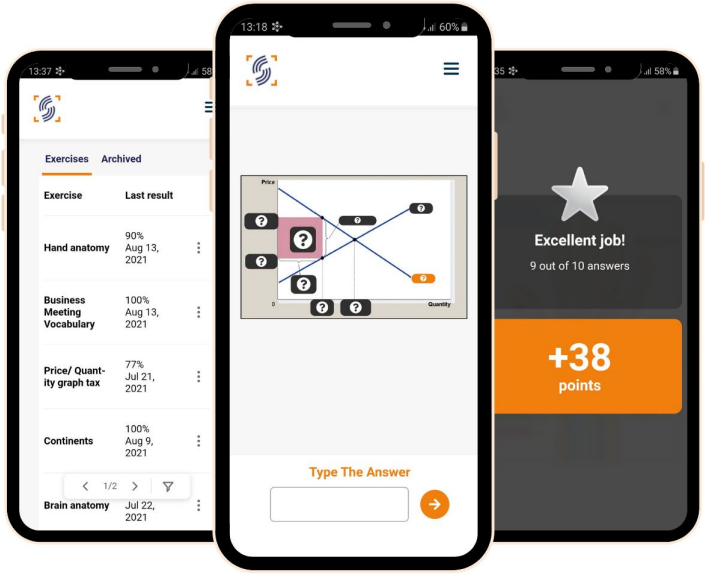
Key features of Smartest

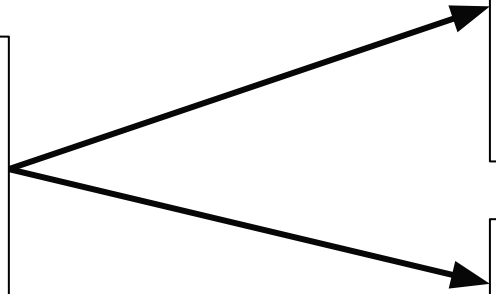


- Create **8+ different interactive exercises** with the help of AI, covering all subjects.
- If necessary, **edit the exercises** with our simple interface.
- **Share the exercises** with your class, and collect analytics on your students.
- Possible to **export the exercises** in other platforms, or to print them.
- Developed for **all platforms**: IOS, Android and Web
- **Supported languages**: English, German, French, Italian and Spanish.

Fact-based exercises

- Natural language processing is used:
  - Analyse the content
  - Select answers
  - Generate false options
- Works for all subjects.

Bern is the capital of Switzerland. With a population of about 144,000, it is the fifth-most populous city in Switzerland.



_____ is the capital of Switzerland.

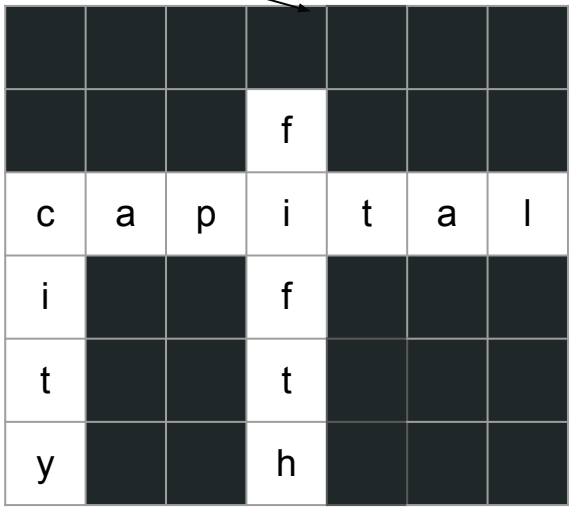
a. Bern
b. Zurich
c. Geneva
d. Basel

Bern is the second-most populous city in Switzerland. **True or False?**

Language learning exercises

English	German
city	die Stadt
population	die Bevölkerung

Bern is the capital of Switzerland. With a population of about 144,000, it is the fifth-most populous city in Switzerland.

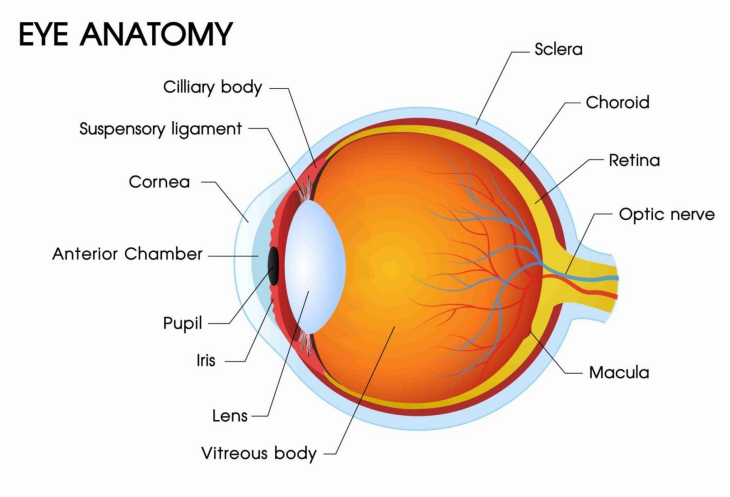


Bern ____ is the capital of Switzerland.

a. is
b. was
c. were
d. had been

Diagram exercise

- Computer Vision is used to detect the blocks.



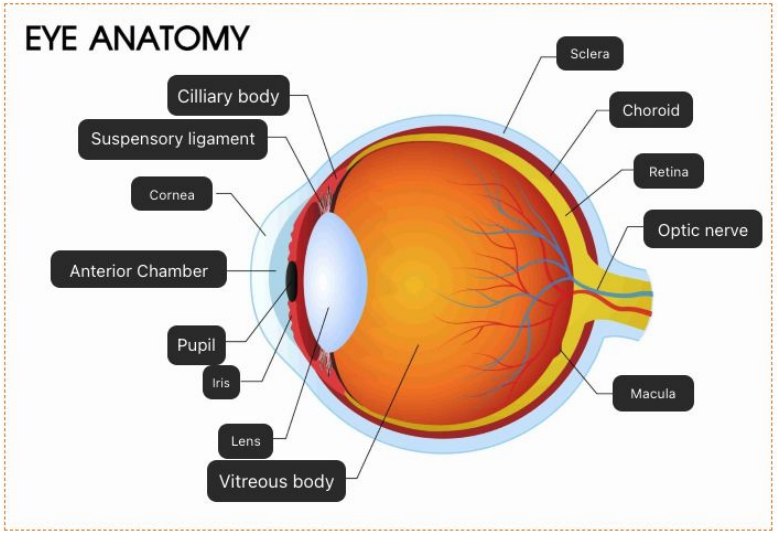
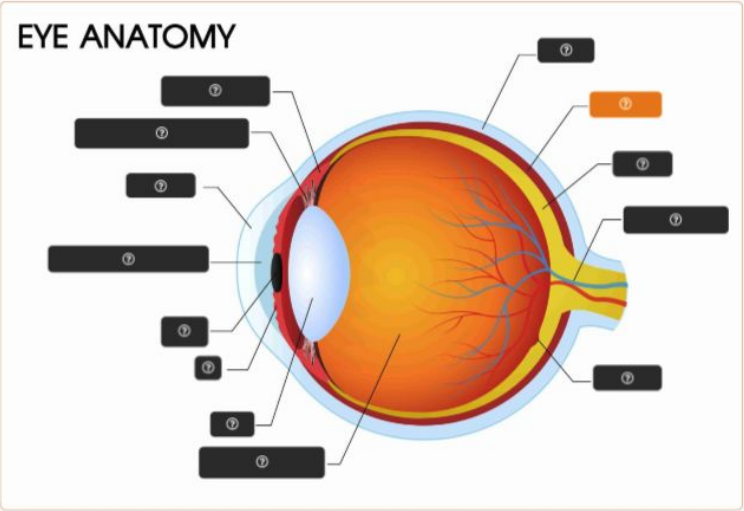


Diagram exercise



- Sclera
- Choroid
- Retina
- Cilliary body

The benefits of using Smartest

“Smartest for me is saving time, valuable time, because I can finally gather my material together in one app and make it easily accessible for my students.”

Tabea Z., primary and secondary teacher,
ITSmove Winterthur CH

“With Smartest, teachers can create a class activity in a couple of minutes and stimulate discussions around any topic”

Rahel Wüthrich, Director, ITSmove School,
Wintherthur CH

Pilot at Ecole Lemania

ECOLE LEMANIA

- We created 250 interactive exercises, targeting the Swiss Maturity exam.
  - Teachers could create more exercises themselves, and assign exercises to their students.
- Different subjects: History, geography, physics, chemistry and biology
- Takeaways:
  - “The interactive format of the exercises makes them more playful and fun.”
  - “By leveraging technology more valuable time can be freed up for other pedagogical tasks essential to 21st-century skills, such as formative feedback, differentiation, and critical debate.”
  - “Textbooks come alive due to Artificial Intelligence”

Conclusion

- AI holds a great potential in Education
  - Augment teachers, not replace them
  - Empower students to explore and to learn at their own pace
- We have looked at several applications of AI in education
  - Personalised learning
  - Universal access
  - Class analytics
  - Smart feedback
  - Smart content creation
- At Smartest, we focus on Smart content creation
  - → make the lives of both teachers and their students easier, and more interactive.

Thank you!

Contact us:
Nikola Nikolov – nikola@smartest.io

www.smartest.io
LinkedIn: smartestlearning