

Lesson Plan #3

Application of AI in Speech and Vision



SAINT

HANDS ON INTRODUCTION TO ARTIFICIAL
INTELLIGENCE IN PRIMARY EDUCATION
USING MINECRAFT

16.05.2023

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Project Number: 2022-1-FR01-KA220-SCH-000087794



Co-funded by
the European Union

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

REVISION HISTORY

Version	Date	Author	Description	Action	Pages
1.0	24/11/2022	TARAN	Creation	C	TBS

(*) Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

REFERENCED DOCUMENTS

ID	Reference	Title
1	2022-1-FR01-KA220-SCH-000087794	SAINT Proposal
2		

APPLICABLE DOCUMENTS

ID	Reference	Title
1		
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Lesson Plan: Application of AI in Speech and Vision

Grade Level: Primary (Ages 9-12)

Subject: Computer Science / Technology

Learning Goals:

1. Understand the basic principles of AI and its applications in speech recognition and vision processing.
2. Examine real-life examples of AI in speech and vision.
3. Apply acquired AI knowledge in practical settings, such as the Minecraft environment.

Session 1: Introduction to AI and Its Role in Speech and Vision (45 minutes)

Objective:

- Students will understand the concept of AI and how it is applied in speech recognition and vision processing.

Activities:

1. Introduction (5 minutes):

- Start the session by providing a clear definition of AI and the fields of speech recognition and vision processing.
- Discuss how AI uses algorithms to understand spoken language (speech recognition) and to understand and interpret images (vision processing).
- Provide examples of AI in speech recognition (like Siri, Alexa) and vision (like self-driving cars, facial recognition).

2. Discussion: Role of AI in Speech and Vision (10 minutes):

- Discuss how AI improves efficiency and accuracy in understanding spoken language and interpreting images.
- Talk about how AI applications in speech recognition have transformed the way we interact with technology, from voice assistants to transcription services.
- Discuss how AI in vision processing has revolutionized sectors like security (facial recognition), healthcare (medical imaging), and transport (self-driving cars).

3. Minecraft Activity (25 minutes):

- Guide the students to design and build a simple AI-powered voice-activated door in Minecraft using command blocks.

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- Discuss how this activity mirrors real-world use of speech recognition AI, such as voice-controlled home automation systems.

4. **Wrap-up (5 minutes):**

- Recap the session by emphasizing the importance of AI in speech recognition and vision processing.
- Preview the next session, which will involve a deeper exploration of how AI is used in specific real-world examples.

Materials Needed:

- Minecraft Education Edition
- Computers with internet access

Session 2: Case Studies of AI in Speech Recognition and Vision Processing (45 minutes)

Objective:

- Students will explore specific case studies of AI in speech recognition and vision processing, such as voice assistants and self-driving cars.

Activities:

1. Introduction (5 minutes):

- Explain the purpose of the session: to explore AI applications in speech recognition and vision processing.
- Identify the specific examples to be focused on in the session: voice assistants like Siri and Alexa, and vision processing in self-driving cars.
- Give a brief overview of how AI is used in these examples.

2. Discussion and Group Activity: AI in Speech and Vision (20 minutes):

- Start by discussing a case study for each example:
 - ❖ Speech Recognition: Explain how AI is used in voice assistants like Siri and Alexa to understand and respond to spoken commands.
 - ❖ Vision Processing: Discuss how self-driving cars use AI for perception, decision-making, and control, enabling them to navigate safely and efficiently.
- After discussing each case study, break the students into small groups and assign them one of the examples. Their task is to brainstorm another potential application of AI in the given example.
- Allow time for each group to present their ideas. Encourage questions and comments from the rest of the class.

3. Minecraft Activity (15 minutes):

- After the group presentations, instruct students to represent their chosen AI application in Minecraft.
- Encourage creativity and allow students to use Minecraft in a way that best represents their idea. The goal is to visualize their concept, making it more tangible and understandable.

4. Wrap-up (5 minutes):

- Summarize the main points from the session. Reinforce the idea that AI has diverse applications in speech recognition and vision processing.

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- Highlight some of the ideas presented by the students during the group activity, praising creativity and thoughtfulness.
 - Preview the next session by explaining that they will be creating an AI-based project that involves either speech recognition or vision processing. This will take the concepts they've learned and apply them in a practical context.

Materials Needed:

- Minecraft Education Edition
- Computers with internet access

Session 3: Creating an AI-Based Project Involving Speech or Vision (45 minutes)

Objective:

- Students will apply their understanding of AI by creating an AI-based project in Minecraft involving either speech recognition or vision processing.

Activities:

1. Introduction (5 minutes):

- At the start of the class, give a brief introduction about the purpose and significance of the day's activity.
- Explain that the students will be using their knowledge of AI to create a project in Minecraft that involves either speech recognition or vision processing.
- Highlight the importance of these two applications of AI in various industries.
- Clarify that their projects should be innovative and serve a purpose or solve a problem in a unique way using AI.

2. Planning and Designing the Project (20 minutes):

- Divide students into groups and instruct each group to brainstorm an idea for an AI-based project that they can create in Minecraft. This could be anything from a voice-activated security system to an animal detection system.
- Each group should then design their project, focusing on the problem it solves, the purpose of their AI, how it would function, and what it would look like. They should also consider the resources they will need in Minecraft to build their project.
- Encourage them to be creative and think outside the box and remind them to keep their project within the capabilities of Minecraft and the time limit.
- Ensure each group has a clear understanding of what they want to create before they start building in Minecraft.

3. Minecraft Activity (15 minutes):

- Once the planning and designing phase is complete, each group should start building their AI-based project in Minecraft.
- They should use their design as a guide and work together to create their project. It's important that they manage their time effectively to ensure they finish within the allotted time.
- As they are building, encourage them to test and modify their project as needed to ensure it works as intended.

4. Project Presentations (5 minutes):

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- After the Minecraft activity, each group will present their project to the class. They should explain the problem their AI solves, the purpose of their AI, and how it functions.
 - Encourage them to demonstrate their project in action, if possible, and discuss any challenges they faced and how they overcame them.
 - At the end of their presentation, allow time for questions and comments from the class. This promotes discussion and peer learning.
 - Congratulate the students on their hard work and creativity and emphasize the skills they've used and developed during this activity, such as teamwork, problem-solving, and technical skills.

Materials Needed:

- Minecraft Education Edition
- Computers with internet access
- Presentation materials as needed