

THE IOT PROJECTS

5 interdisciplinary and hands-on STEM projects have been developed that showcase the concepts of the AI4STEM curriculum. The projects blend aspects of AI and IoT and are divided into 5 main activities, reflecting each of the 5 Big Ideas. They include teaching materials and resources for both educators and students, helping them to unpack and fully grasp the core ideas behind AI and IoT, and to develop and extend their skills and knowledge in the aforementioned topics. All 5 projects use the BBC micro:bit board and a range of compatible components, and aims to introduce learners to different fields.

The 5 projects are:

#1: Smart Intruder Alarm (creation of a smart alarm system that integrates AI concepts)

#2: DIY IoT Robotic Car (creation of a DIY robotic car that can be controlled using voice commands)

#3: AI & Computer Vision Technology (creation of a smart vision system that can execute several tasks, including object, face and color recognition)

#4: Voice-Controlled Home Lighting (creation of a DIY controlled lighting system)

#5: AI-Powered Puzzles (creation of mini-games and puzzles powered by AI elements)

THE AI4STEM IoT KIT

The AI4STEM IoT Kit is based on the use of the BBC micro:bit microcontroller. The Kit contains all the necessary hardware (microcontroller, sensors, peripherals, etc.) incorporating physical computing and programming concepts to help learners implement the 5 IoT projects. It also includes a manual that informs the readers about the components of the kit and briefly explains their use and their functionality, and a "Getting started" guide to introduce readers to the Microsoft Makecode software.



THE AI4STEM ACADEMY

The AI4STEM Academy is an online collaboration space for educators, students, AI enthusiasts, and other stakeholders to access project resources, showcase their IoT projects, build synergies, and further develop the project idea and results. Educators and learners can create a free account and log in to the AI4STEM Academy from [here](#)



**INTRODUCING THE 5 BIG IDEAS
IN ARTIFICIAL INTELLIGENCE
USING INTERNET OF THINGS IN
STEM EDUCATION**

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ABOUT THE PROJECT

The AI4STEM project is an Erasmus + project that aims to introduce artificial intelligence to students aged 8-16 through hands-on learning interventions and projects that combine AI with IoT principles and STEM. Using the Five Big Ideas in AI (namely Perception, Representation & Reasoning, Learning, Natural Interaction, and Societal Impact), as identified by the creators of the AI4K12 initiative (<https://ai4k12.org/>), the AI4STEM project develops an educational framework that helps educators and learners to understand these rather complex topics, by suggesting feasible ways to introduce these ideas in the classroom, along with concrete learning objectives, enduring understanding, domain knowledge and connections to STEM curricula.

Find more:

[HTTPS://AI4STEM.ERASMUSPLUS.WEBSITE/](https://ai4stem.erasmusplus.website/)

The consortium



PROJECT OBJECTIVES



Provide educators with a curriculum to introduce students to AI, in the light of the Five Big Ideas, and through a series of modules that focus on different areas where AI is applied in everyday life, including robotics, vision, speech and games.



To develop a series of hands-on IoT projects, including teacher guidelines and student worksheets, that demonstrate how AI can be introduced into the classroom, through the lens of STEM.



To develop a kit containing all the components needed to implement the IoT projects and a user with brief explanations of the included components and suggested software.



Create a community of practice for educators and learners through a virtual academy, ensuring continuity and development of project outcomes, and encouraging collaboration and constructive discussion.



To pilot and evaluate the kit and the IoT projects in upper-primary classes and secondary schools

THE AI4STEM CURRICULUM

The AI4STEM curriculum consists of 6 modules that aim to smoothly introduce both educators and students into various aspects of AI by offering essential information in a comprehensible manner, and by proposing several pedagogies and strategies through the lens of the 5 Big Ideas and IoT.

The 6 modules are:

AI & Its application in everyday life:

revolving around the definition of AI and its common application in our life.

AI & Generative Application: emphasizing on AI in STEM education and Generative AI applications that can facilitate STEM learning

Application of AI in Robotics: about AI's role in Robotics, in the context of STEM education and IoT.

Application of AI in Speech: showcasing various AI applications in Speech

Application of AI in Vision: exploring the use and application of AI in Vision

Application of AI in Games & Puzzles: focusing on AI in gaming applications and puzzles.

